THE

SOUTHERN AGRICULTURIST.

MAY, 1831.

PART I.

ORIGINAL CORRESPONDENCE.

ART. I.—*Account of, and Directions for erecting a Sugar Establishment; by* J. HAMILTON COUPER.

"Hopeton, near Darien, (Ga.) 30th July, 1830.

Dear Sir,—In compliance with your wish to be furnished with plans for the erection of sugar works, the enclosed drawings are forwarded; in the hope that, with the accompanying explanations, they may contain some practical information, useful to such of your subscribers as are about to embark in the culture of the cane.

In offering these drawings to you, they are presented as exemplifying the best mode, which has come to my knowledge, of setting a number of hemispherical kettles to a single and powerful furnace, on the West-India and Louisiana plan. The effect of the intense fire under the teach, in discolouring the sugar, and in converting a part of it into molasses, is so very objectionable, that the whole system, even in its most perfect form, must be regarded as highly defective. As it, however, combines economy and simplicity with rapidity of execution, in a greater degree than any other offered as a substitute, it may be received as the best, for the purposes of the planter, of any as yet sanctioned by experience. A reasonable hope may, however, be indulged, that by the use of steam or hot air, the advantages of the present system, freed from its defects, may, ere long, be obtained.

To those familiar with the subject, the following explanations may, perhaps, appear unnecessarily minute: but this is a defect which it is believed will be readily pardoned by those to whom the subject is new, and who are in pursuit of information no where to be found embodied in a form generally accessible to planters. For, with the exception of Dr. Higgins' Treatises,* I am not aware that any work exists, which contains directions for the erection of sugar works, that are sufficiently full and practical; and the inquirer is compelled to obtain the knowledge which he seeks, from scattered sources and personal inspection, or to rely on workmen ignorant of correct principles.

Of the accompanying drawings, plates 1 and 2 will give an idea of the general arrangement of a sugar establishment, on a large scale: and plates 3, 4 and 5, of the mode of setting the kettles. By modifying the proportions, they may be adapted to works of any size, which it may be desirable to erect.

It will be perceived, that the general arrangement as shewn in plates 1 and 2,—which represents the sugar works on this plantation—differs, in some respects, from that adopted in Louisiana: for instead of four kettles set to a single furnace, and two wooden receivers, each system consists of five kettles to one furnace, and a sixth kettle and two copper receivers heated by another. The heat from the teach-furnace being sufficient to keep five kettles in active ebullition, there is an economy of fuel in the use of five, instead of four vessels, to that fire. The important advantages of checking the fire, when the juice arrives at that stage of the heating, technically called *yawing*, without arresting the boiling of the other kettles, and of heating the juice as soon as it comes from the mill, have decided the adoption of this arrangement, which is strongly recommended by Dr. Higgins; and which was found during the last season to perform remarkably well. Instead of two curing-rooms, one on each side of the cooling-room, and at right angles to it, there is but one which is placed on a line with the other parts of the building. This deviation from

* "Observations and Advices for the Improvement and Manufacture of Muscovado Sugar and Rum, by Bryan Higgins—1797, 1801 and 1803." A work clear in the exposition of principles, and minute in practical details; and which leaves little to be desired, except the addition of those improvements which experience and the progress of science have made to the subject during the last twenty-five years.

the Louisiana arrangement, has been made to give more air to the cooling-room—to admit of laying rails in the most advantageous manner from the cooling vats to the hogsheads in the curing room—and to adapt it to the course of a canal, which runs parallel to the length of the building.

In plates 1 and 2, the same letters refer to the corresponding parts. The building has the same width throughout; being 39 feet outside measure: and the outer walls are all 20 inches thick at the base, diminishing to 18 inches at the line of the top of the kettles; except those of the curing room, which are 24 inches as high as the bottom of the joists, where there is a set off of 6 inches, to receive a three-inch plank supporting their ends. The height of the engine, mill and boiling rooms, is 26 feet, from the foundation of the walls to the top of the joists: and of the cooling and curing rooms 16 feet. The length of the engine-room A, is 10 feet, and it is divided from the mill room C, which is 20½ feet long, by a partition wall 2 feet thick, rising as high as the shaft of the rollers. The boiling-room D, is 60 feet long; the cooling-room E, 44 feet; the curing-room F, 98 feet, making, with the walls, a total length of 240 feet.

The walls are all constructed of tabby, and the floors of the cooling, boiling and lower mill-rooms are of the same material. The engine boiler B, is placed in a small wing on the outside of the building. The waste hot-water runs into a cistern *b*, and by pipes is conducted to the receivers *s*, *s*, *s*, *s*, for filling and cleansing them and the kettles when required. *C*. is the engine chimney, which is 50 feet high.

The steam engine *a* is on the low pressure principle and of the portable form, from the manufactory of Bolton & Watt, and is of a fourteen horse power. Being intended to drive rice-pounding and threshing-mills when not used for grinding canes; the power is greater than is required for the sugar mill alone.

The sugar mill *f*, is of the horizontal, triangular form, consisting of three equal rollers 60 inches long, 28 inches diameter, revolving five times per minute, and expressing with active feeding from 1000 to 1200 gallons of juice per hour. The foundation upon which the mill rests is of tabby, capped by a frame of timber, and is so braced by abutments and wings as to be perfectly firm.

The canes are brought by flats to the foot of the inclined plane *g;* when they are transferred to cars, which are

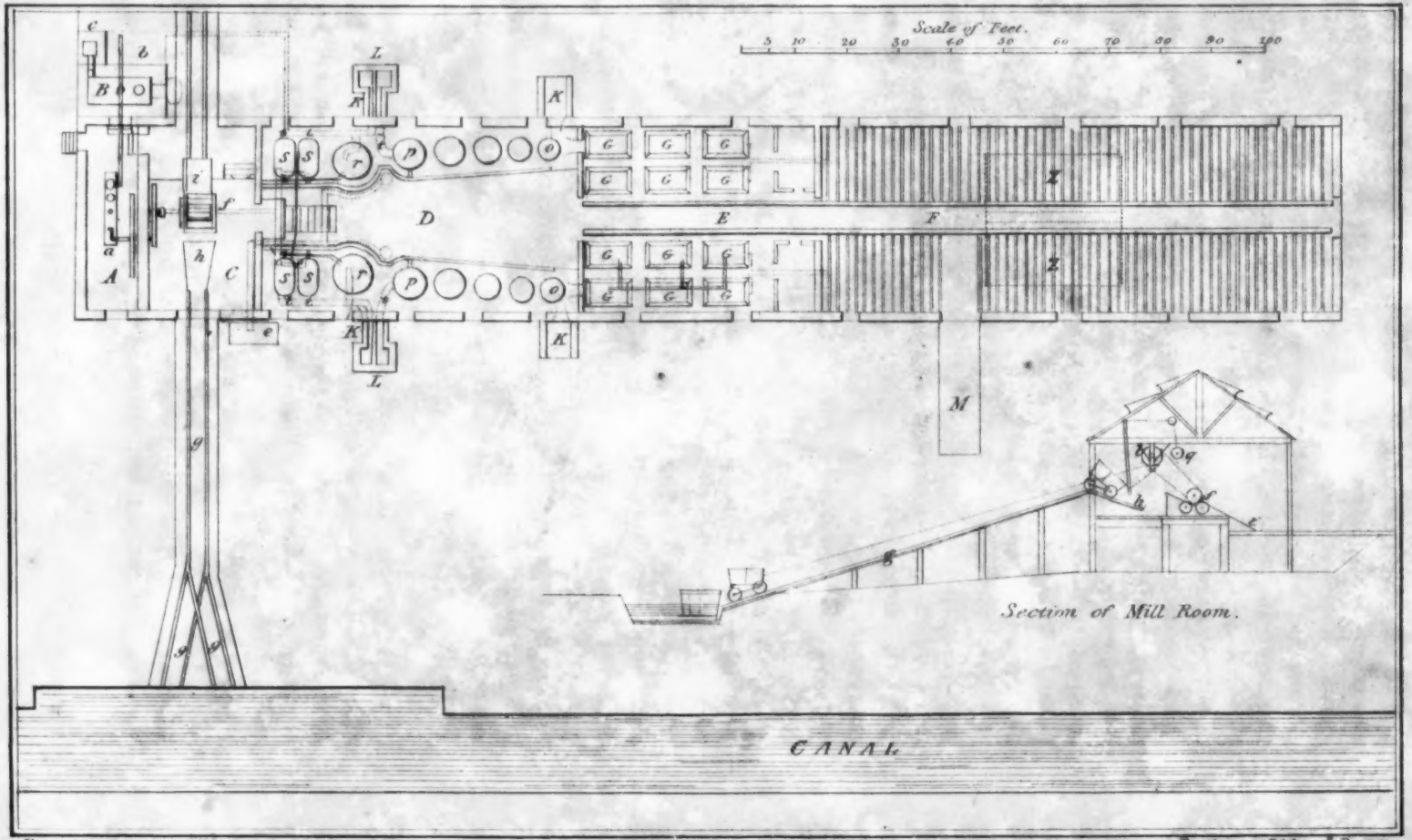
dragged up the plane by a rope winding around a drum, *l*. On the same shaft with the drum is a band-wheel *n*, connected with another wheel *m*, on the mill shaft, by a band of leather so slack that unless pressed upon by a tightening pulley, it slides freely around the wheels and gives no motion to them. The tightening pulley *q*, moves freely up and down in a frame, and is connected by a rope passing over rollers with the upper end of a lever. When this lever hangs in a perpendicular position, the tightening pulley presses with its whole weight on the band, and setting the drum in motion winds up the rope to which the car is attached; when the full car has arrived at the termination of the inclined plain at the mill door, and the front wheels have passed the highest point and are descending on the opposite side, the lower end of the lever is carried forward by the car, and raising the tightening pulley throws this machinery out of geer, and arrests the car at the moment when it has shot out its load of canes on the table *h*.

As the upper end of the lever is carried forward, it is prevented, after passing so far, as to withdraw the pressure of the tightening pulley from the band, from returning by a catch; and the machinery remains out of geer. An attendant pushing the car by a slight effort, beyond the turning point, allows it to run down the plane by its own weight, until it arrives at the foot, when the rope is transferred to another car which has been loaded during the journey of the first. At a signal the catch is raised; the lever returns to its original position, and the tightening pulley pressing in the driving band, the drum is set in motion, and the car is carried up to the mill.

The mill-feeders take the canes from the table *h*, and placing them on an inclined board, which projects so far forward as to prevent their hands being within reach of the rollers, shove them regularly forward. The expressed canes, after passing between the second and third rollers, slide down the trough *i*, on the side of the mill opposite to that at which it is fed, and are carried off to a convenient distance from the building, by cars running on wooden rails.

The juice which falls into the mill-bed, below the rollers, is carried by wooden troughs to the receivers *s*, *s*, *s*, *s*. At the ends of the troughs seives of fine brass wire are placed to arrest the coarser impurities of the juice.

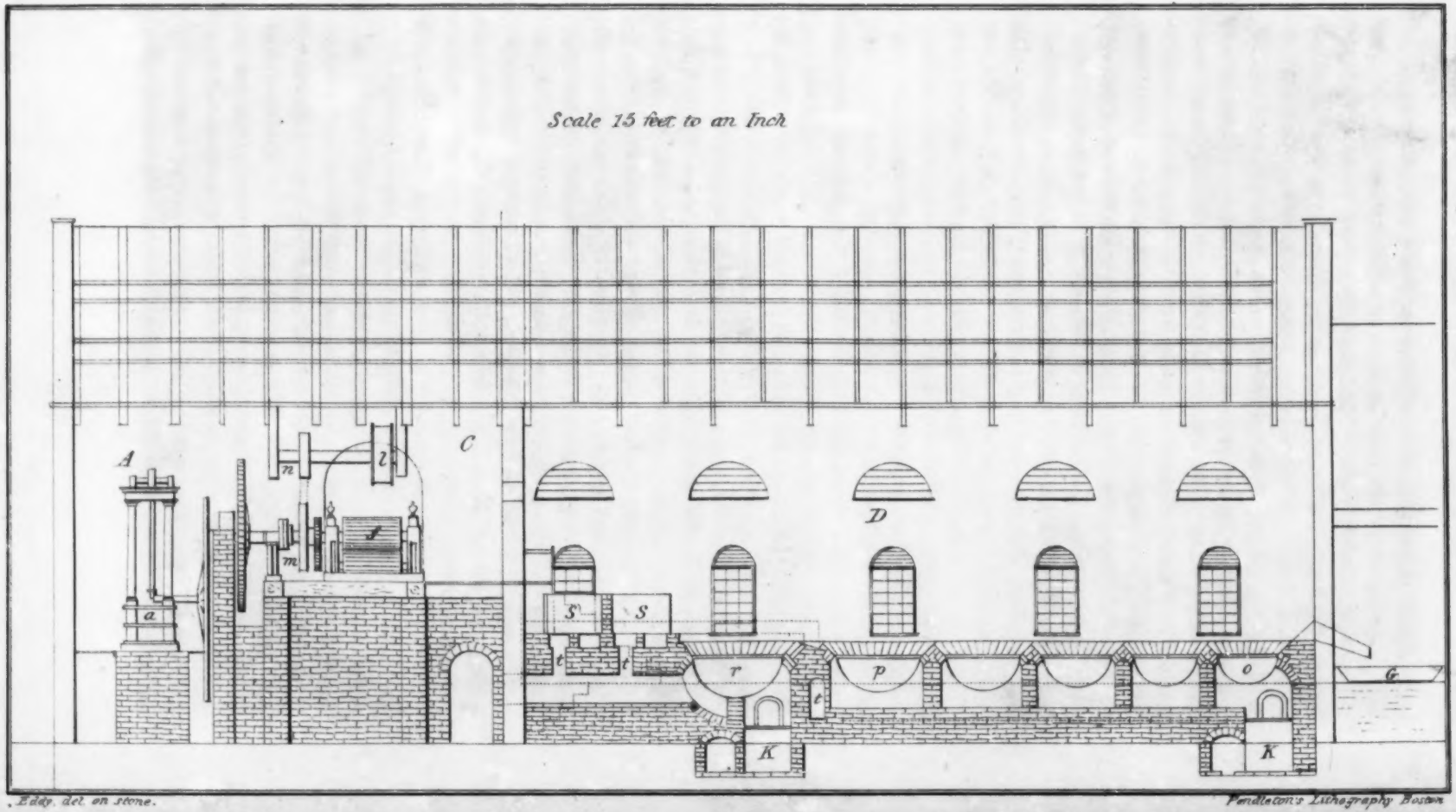
PLATE I.



Eddy del. on stone.

Pendleton's Lithog.y Boston.

PL. 2.



Eddy. del. en stone.

Pendleton's Lithography Boston

There are two copper receivers of 500 gallons capacity to each system of kettles, heated by the flame from the furnace of the clarifier *r*, which is made to pass under them alternately, by raising or dropping two dampers, *t*, *t*. As soon as the juice has run into a receiver to the depth of a few inches, its damper is raised and the heat is applied to it, until the clarifier is ready to receive a charge of juice; the damper is then lowered and that of the other receiver is raised. The cock being opened, the juice runs until near the bottom, when it becomes thick, then the passage to the clarifier is shut off, and that to the scum trough opened.

As soon as the clarifier, which contains 480 gallons, but is usually charged with 400, has received the juice, the fire is raised by the addition of fresh fuel, and is kept up until the thick dark scum which forms on the surface of the liquor begins to crack, and spots of white froth are protruded through it to the surface. When this appearance, which is called *yawing*, occurs, the fire is checked, and the juice is not allowed to boil up until it is sufficiently skimmed, to be ladled forward to the kettle *p*.

The five kettles from the teach *o*, to the grand kettle *p*, which are of the capacity of 80, 122, 188, 263 and 353 gallons, are heated by another furnace which is placed under the teach. A damper is set in the flue, beyond the grand kettle; and the ash-pit is furnished with a sliding door. When it is required to check the fire in emptying the teach, the ash-pit door is closed—moist cane trash interposed between the fire and the bottom of the kettle, and stuffed into the feed-mouth of the furnace, and the damper dropped so low as merely to produce draught enough to prevent the smoke from passing out at the furnace and ash-pit doors.

A trough is placed along the edge of the brick work to receive the scums and washings of the kettles, and communicates with the scum-tub *e*, on the outside of the building.

From the teach the syrup is ladled by a spout and troughs into the coolers, *b*, *b*, *b*, *b*. The troughs are furnished with straining seives of wire and with branches and gates to direct the syrup to the different coolers, at pleasure.

The twelve coolers are made of two-inch cypress planks, tongued, grooved and rabbetted together, and level outwards on every side: the interior size at the bottom is 7 feet by 4 feet, at the top 8½ feet by 5½ feet, and the perpendicular height is 14 inches. The level is intended to give

a diminished depth of syrup to each additional skip, in order to preserve an uniformity of temperature: and the size of the coolers is so adapted to the capacity of the teach that each skip, or discharge of the syrup from the teach to the cooler, goes on diminishing from 2 inches, the depth of the first, to about 1½ inches that of the sixth. The floor of tabby on which the coolers are placed, is slightly depressed under them from the edges to the centre; forming two slightly inclined planes meeting at the middle in a small gutter from 1 to 4 inches lower than the bottoms of the coolers. There is a descent in the gutter, from the end next to the teach, to that farthest from it, and at the latter a trough is attached which leads to the molasses cistern. The inclined planes being plastered with Roman cement, and the spaces between the coolers covered with platforms of boards, the leakage of syrup is carried, without any loss or admixture of dirt, to the molasses cistern: while at the same time the bottoms of the coolers are kept warm by the exclusion of the air.

The granulated syrup is taken up in buckets from the coolers; and the buckets, placed in a car which runs on wooden rails, are carried opposite to the hogshead, in the curing room, into which they are to be emptied.

The sugar hogsheads stand on joists resting on a centre wall, and the projecting ledges of the walls of the room. The joists are three inches wide, 12 inches deep, and 18 inches apart: under them, on each side of the centre wall, are two floors of tongued and grooved boards, sloping at an angle of 18 degrees to a gutter, 6 inches wide and deep, in the centre between them, which leads to the molasses cistern. The molasses dripping from the sugar hogsheads is received on these floors, and thence runs to the cistern.

The two molasses cisterns, *z*, *z*, contain each 7,000 gallons, and are constructed of tabby, plastered with Roman cement: the walls are 18 inches thick and 5 feet high, and the floors are 6 inches deep, they are sunk 4 feet below the surface of the ground, and are covered with tongued and grooved boards, to exclude rats and dust. A platform of boards, 5 feet wide, runs the whole length of the curing-room, and at each end terminates in a door 8 feet wide; a similar platform at right angles to the first leads to another door of the same size, in the side of the room next

to the canal. The hogsheads for molasses are placed upon the latter platform, filled by pumps from the cisterns, and rolled down the gangway *M*, to the edge of the canal.

This curing room is calculated to contain 350 hogsheads of sugar of 1000 lbs.

The line of the floor is the same in the boiling and cooling-rooms, and only 6 inches higher in the curing-room: in the first it is 3 feet below the top of the brick work of the kettles. A flight of steps from the boiling-room leads up to the mill, and another below affords a passage out of the building by two doors under the large mill doors.

The position and sizes of the doors and windows will be best understood by a reference to the plates: and it will only be necessary to observe that the doors connecting the boiling, cooling and curing-rooms, are made 8 feet wide, to admit of the passage of the kettles.

The ventilation of the steam, in the boiling-room, is effected by ten sashed windows of eighteen lights of 8 by 10 glass, which move up or down—ten large semi-circular windows furnished with Venetian blinds, and two lines of openings in the roof, extending over the boiling-mill and engine-rooms, 14 inches deep, and closed at pleasure by shutters suspended from above by hinges on the principle of the windows of a blacksmith's shop.

As a minute description of the mode of setting sugar kettles will be given in the explanation of the plates referring to that subject, it will only be necessary to remark here, that the principles adopted in these works, are generally the same as will be there pointed out. The saddles, or intervals between the surfaces of the kettles, are covered with lead, but the remainder of the raised curving of the kettles is of wedge-shaped fire bricks: and the whole of the interior of the furnace, exposed to the action of the fire, is lined with fire bricks, as far as the chimney.

These works were used for the first time, the last fall; and the performance of every part was satisfactory. One set of kettles only was employed; but with it 600 gallons of cane-juice were boiled off per hour. When in full train, skips of 300 gallons were made in twenty-five minutes. At this rate, as the juice passes through seven vessels, in the first of which it is heated as it comes from the mill, the time occupied between the expression of the juice and its conversion into syrup of sugar proof, is for the first half of

the charge from 3 to 3¼ hours, and for the second from 3¼ to 3½, or an average of 3¼ hours. The usual performance of four kettles set to a single fire, is a skip in an hour or an hour and a half. Assuming the first—as the juice is collected in a wooden receiver, the time required to boil it off, will be, on an average, 4½ hours:—at the second rate of performance, the time occupied will be 6¾ hours. When it is considered that the juice remains, a part of it from an hour to an hour and a half—and the whole on an average of from half to three quarters of an hour—before its impurities are separated by heat, and that very injurious changes are occurring during this delay, and in proportion to its continuance, the advantages of the separate furnaces and copper receivers will be obvious.

(To be concluded in our next.)

ART. II.—*On the Management of the Cow-pen and Dung-stead; by* C.

Dear Sir,—I observe in your Agriculturist for last month, a quere, over the signature of "*A Cotton Planter,*" soliciting information respecting "the most profitable way of using well-rotted cow-pen manure, which has been laying in heaps a whole winter, for cotton land." As this is the season for making manure with our stock, and the time is fast approaching for its application to the soil, it is to be hoped that many of your correspondents may communicate the result of their own experiments, so as to enable your readers to form more correct opinions, and consequently to expend their time and labour with greater certainty of the desired success. Having been in the habit of collecting and making manure with my cattle, during the winter, and applying it principally to cotton land the ensuing spring, I have been induced to state the process I have usually adopted for the last seven years, which although not strictly applicable (nor intended) for a solution of the question proposed, yet having derived some benefit from the practice pursued, myself, I feel desirous of submitting it for the consideration of others. I am aware that it has heretofore been the pre-

vailing opinion, that the benefit to be derived from the application of fresh or long manure to the soil, was very uncertain, and in dry seasons often injurious. My own experience justifies a different conclusion, as during the time before stated, I have, by manuring with compost or cow-pen manure, made with my stock in the months of November to the March following, inclusive, (five months) and applied to cotton land in the spring, generally averaged from 900 to 1000 lbs. of seed cotton to the acre, whilst in 1829, it produced 1122½ lbs. seed cotton, per acre; the last season was, indeed, an exception; but even then, although we had in this section of the State no rain for eleven weeks, at one time, and that in the months of June, July and August, yet my manured land produced more seed cotton per acre, than the same quantity of any other of the unmanured land I planted—from this I infer that if the land is well prepared, and the manure sufficiently covered, it is not more subject to be effected by dry seasons, than unmanured land. But to proceed—as I conceive that the form and situation of the cow-pen and dungstead is of more importance than is generally imagined in facilitating the making and hastening the fermentation of the manure, it may be of use to state, that mine is an oblong square, 200 feet in length from North to South, and 60 wide from East to West; it is situated on the South-East side of a rising ground, the top of which is covered with young spreading trees; in addition to which are stables, corn and shuck-houses, together with a cow-house, and other buildings, all on the same side, which completely shelters it from the North and West. Along the lower or East side, is an excavation or dungstead 16 feet wide and 2½ deep, and on the outer side is run a post and rail fence on the top of a bank of earth thrown up out of the dungstead 2½ feet high, the fence is between 5 and 6 feet high, hence from the bottom of the dungstead to the top of the bank is between 4 and 5 feet, to which add the heighth of the fence, and an idea can easily be formed of the favourable situation in which the manure is placed, when hauled down into the dungstead to promote fermentation. The upper side of the dungstead is gradually sloped down so as to admit the carts or wagons when loaded to ascend with ease, consequently the manure can be loaded into the wagons, without removal, and hauled immediately

into the field, thus expediting the operation, which at this busy season, is of no little importance. I have only to add, that there is an open drain 18 or 20 inches deep, made along the upper side of the pen, to convey or carry off any water that runs down from the higher ground during rainy seasons, thus only that which falls on its surface gets into the pen, and after oozing gradually through the dung and litter spread over it into the dungstead, is absorbed by the manure, and serves to hasten its decomposition. It will be observed, that after deducting the width of the dungstead there is only forty-four feet in breadth left, hence that is the greatest distance necessary to have the manure when sufficiently trampled into the dungstead, this makes the labour comparatively easy, and as this operation has to be repeated at least five or six times during the winter, it is a great saving of time, and in my opinion gives a decided preference in favour of the oblong over the square form of a cow-pen, for accelerating the making and hastening the decomposition of the manure; the size of the cow-pen ought of course to be in proportion to the quantity of stock kept, mine is only about thirty head, but the better way is not to make it too large, as, in that case, the litter and droppings from the cattle scattered over too great an extent of surface, is too much exposed to the action of the sun and air, and its strength exhausted by evaporation, but on this subject every man can judge for himself.

Having sufficiently described the situation and form of the cow-pen, I will next proceed to state the time I begin to haul in materials, and the manner in which the manure is made. I generally commence to cart and haul in corn stalks early in November, and as the cotton picking is finished I pull up the stalks also, and carry them into the pen, spreading them over it as regularly as possible; this together with leaves and other vegetable matter convenient, with the refuse of the food given to the cattle, say shucks, oat and wheat straw, pea vines, &c. are, after being sufficiently trampled by the cattle, and saturated with the dung and urine, hauled down with dung forks and hoes into the dungstead; the dung from the stables is also weekly carted out and spread over it, and at times rich earth is carried and spread over the whole mass three or four inches deep, the surface of the pen is then again covered as before with the like materials, and in due time hauled down into the

dungstead, thus alternately bringing into the pen fresh materials, and after being sufficiently trampled, removing them in like manner, to be replaced by others; always observing as far as practicable, to remove the manure into the dungstead the next day after rain, or as soon after as it can be done, with comfort or safety to the health of the negroes employed. Pulling up cotton stalks I also regulate in the same manner, as a hand can pull up two acres immediately after rain, with more ease than half an acre a week hence; it is also of use to have the materials ready to spread over the pen as soon as the trampled manure is hauled into the dungstead; this is not only a saving of food which would otherwise in part be lost, but by having the pen covered over with stalks and other materials the same day it is cleared down, the cattle have a comfortable bed to lay on, which is no doubt very agreeable to their feelings, and conducive to their health.

I have been induced to say thus much respecting the cow-pen and dungstead, from a belief of their advantages over any others I have had an opportunity of seeing, in hastening the making and fermentation of the manure.

I shall only add, that my cattle have never been permitted to leave the cow-pen except for the purposes of going to water, since Christmas last. In a future communication, I will say a few words respecting the cow-house and milking pen, also the calf and sheep's pen, attached; and then proceed to state the usual mode in which I prepare the land and apply the manure to the soil. But as this is already much too long, I shall conclude, with an assurance of my best wishes for the more extensive circulation of your useful work, and punctual payment from your numerous subsribers.

Respectfully, yours, C.

Georgia, Western Circuit, February 14, 1831.

ART. III.—*Account of the Mode of Culture pursued in Cultivating Corn and Peas; by* ST. JOHN'S COLLETON.

Mr. Editor,—Some time ago I promised to give you an account of my method of making corn. The land on which

I plant, is of a thin, or rather loose soil, and in the common and old way of planting corn, five feet apart, or five feet square, on my land, could not possibly average me over twelve bushels per acre. But for the last four years, I have twenty-three beds in the task, or quarter acre, and plant on the beds, from hill to hill, three feet apart; leaving two stalks of corn in each hill, and my corn crops have averaged from eighteen to twenty-two bushels per acre. I have never been enabled any one year to manure all of my corn, indeed but a small part. In 1828, we had a most trying season for early corn, for the weather was dry in the month of May, and much more so in the month of June, and withal, my corn never "fired," within; I shall distinctly state, that only about fifteen feet all around the field of corn did "fire." I was present all the time, and had an opportunity of seeing it every day, until the fourth day of July, when I left for my summer residence. To the best of my recollection the corn was in tassel from the 9th day of June, until the 1st day of July before we had rain, which eventually saved it. But I have digressed a little, and should have said a little before, that I could never account for the corn not "firing" within, unless it was that the sun never shone on the earth, and that the earth was always shaded by the closeness of the corn. I have tried the distance of a foot and a half, and two feet apart, and leaving a single stalk in a hill, but never have had so good an average of corn, as when I plant three feet, and leave two stalks. The last year a neighbour of mine planted ten acres, (I understood him to say) of swamp land, agreeably to my method, and when the corn was harvested, he informed me that he had made from it upwards of forty bushels to the acre. Thus was he so pleased with my method, that he said he would never again plant corn in any other way. Another, and an adjoining neighbour, who plants largely, planted part of his crop agreeably to my method, said to several of his neighbours, that he would have to build an additional house to put his corn in, for that he had never before made so much.

On the subject of peas, (cow-peas,) I can only inform you, that for the last five years, I have always made an abundance from being planted in among the corn. Previously, or for six years before, I could not succeed in making peas from the corn field, by planting in hills. Some

years I scarcely made more than seed for another year. But since I have adopted the latter method of drilling them, just under the roots of the corn, and on the side (east side) of the bed, I never have failed in making large crops. My time for planting depends on the advance of the season—if the season is early, I plant from the 25th to the 30th of June, and if the season be not so early, I plant between the 1st and 10th of July.

Respectfully, yours,

ST. JOHN'S, COLLETON.

February 9, 1831.

ART. IV.—*On the Culture of Provision Crops, in reply to "Q IN A CORNER;" by* Y. Z.

Mr. Editor,—Please to inform your correspondent "*Q in a Corner,*" that he must parcel off so much land for his potatoe crop, as will be equal to one-fourth of an acre to each taskable hand he employs, and manure it generously either by cow-penning, or with well-rotted compost; plant his seed either whole or cut into two or three pieces, betwixt the 15th March and 1st April. As soon as he discovers the young grass springing up, shave the sides of the beds lightly, in a few days after haul them up with care; when the crop is generally up, plough them a furrow on each side of the beds, with a cutter, shovel, or what is by some denominated the yankee plough, throwing the earth to the centre, then split the centre with a fluke, which will measurably return the earth from whence it came—this being done, haul up the earth very nicely with the hoe—these operations will generally bring around the 1st of May—after that, when found necessary, haul with the hoe again, and hand-pick the grass near the young plants—after that, never suffer a hoe to be used on the beds—but carefully hand-pick the grass; with a little addition of manure, the same field may be planted two or three years successively to advantage; and two such fields alternately planted, will be found still more profitable. Plant to the hand, on stub-

ble or other good ground, half an acre of slips or vines, in June, or early in July, and treat them as kindly as above directed, and he will seldom have cause of complaint. He says truly, that they are an incomparable root; when we have them abundantly, (as we ought to have every season) our domestics, as well as every thing else, may be fed on them advantageously.

With respect to a corn crop, I advise him to plant at least one acre to every full hand, to manure and work it well with ploughs and hoes, and he will find instead of ten, he will make fifteen bushels per acre. By using the plough freely, he may have his full market crop, besides an abundant provision crop, and be independent, (as far as regards himself) of any other State.

Y. Z.

February 15, 1831.

ART. V.—*On the Culture of Cotton on reclaimed Marsh Land; by* EDWARD BARNWELL.

"Beaufort, February 25, 1831.

Dear Sir,—In compliance with your request, and my promise, I forward you a continuation of my experience in the culture of salt-marsh lands. The crop alluded to in the communication of September, 1827, in consequence of the repeated heavy falls of rain, and an early frost in October, yielded about 20 lbs. to the acre.

In 1828, eighteen acres more were banked in, which yielded 275 lbs. to the acre. This being the first year, high-ground earth was put in the holes. Ten acres which had been cultivated two or three years, did not produce more than 175 lbs. to the acre, in consequence of leakage through fiddler holes in the banks, and the land becoming too much saturated with salt water. A neighbour of mine, however, whose land I planted in '26, and '27, and which was so much injured by the heavy rains, &c. by returning the beds, and putting high-ground earth in the holes, to insure an early and regular vegetation, made very nearly 300 lbs. to the acre.

In 1829, thirty acres were cultivated by me. Ten of which had been in culture four years. The land now becoming husky, the spring being very dry, and no high-ground earth applied, the cotton sprouted late in May. The subsequent rains, and in every respect unpropitious season, to the sea-island planter, caused a product of 50 lbs. to the acre, on the lands of my neighbour, as well as my own. Yet, this was a greater average than our high grounds yielded.

The last year thirty acres were again planted, ten of which the fifth time. The spring was a dry one, and I planted over three times, soaking the seed after the first planting, and notwithstanding, did not set my crop well, until very late in May. The subsequent season was a fine one, and promised a large result. But the storm of the 17th of August again laid my pleasing anticipations in the dust. The average to the acre is about 60 lbs. the same as my high land. My neighbour, however, being considerably sheltered by some high woods, will realize at least 175 lbs. to the acre. His high lands will not reach 100 lbs. per acre.

Perhaps it will be well to furnish some experience as to the erection of the banks. They should be, at least twelve feet wide at base, and no ditch dug inside, or not nearer than thirty feet. The fiddlers being amphibious, will make horizontal perforations from the side of the inner ditch, to the outer, if they are nearer than forty or fifty feet, that the water may, at high tide, flow through. The earth, or mud, must be well rammed when forming the bank, and the best obstruction I have yet found, to prevent this enemy from boring along side of the trunks, which is their favourite place of resort, is our common green moss rammed in, with stiff mud, or clay. Some of my first banks not being well rammed, and having inner ditches, and those too near, have given me the labour of digging them all to pieces, by short distances, to keep out the tides, and ramming them completely anew. I have also filled up the inner ditches and dug others farther off.

I am not yet prepared to give a decided opinion upon venturing on the culture of these lands. The above facts must speak for themselves. But, I am still inclosing more land; and remain,

Yours, very respectfully,

EDWARD BARNWELL.

Art. VI.—*On Plantation Gardens; by the* Editor.

(Concluded from page 196.)

It is not our intention to enter into any minute detail of the course to be pursued in the rearing of seeds. These may be found in most works on gardening, and to them we refer our readers. Our object is merely to throw together a few hints, applicable to our climate, which, perhaps, may be of some little service to the inexperienced, and with them to close a subject which may have become tedious to many. We shall therefore be concise in our remarks what we wish most to impress on our readers is, that the *earliest and most perfect* plants should always be reserved for seed, and that these should be planted at as great a distance as possible, not only from those of the same kind, but from all others of the same family; for instance, cabbages should be separated not only from all other cabbages, but also from turnips, and it is even said that they will degenerate if planted in the neighbourhood of radishes It, therefore, becomes necessary to guard against all admixture; and we would recommend that three or four scites (or as many more as may be deemed necessary) be selected, at considerable distances from each other; that these be enclosed, manured, and in every respect carefully prepared for the reception of plants, and constantly appropriated to the rearing of seeds; they need not be large, as only a few plants will be required of each kind, and several kinds of vegetables may be planted in each, which could not be done in one enclosure without a certainty of their degenerating.

In selecting plants for seed, we have said that only the earliest and best should be chosen, and all tendency to degeneracy should be carefully guarded against, by rejecting those which exhibit the least appearance of it. Cabbages should be selected for their large firm heads, having at the same time but few loose leaves and a small short stem. Turnips should have but few leaves, a small neck and a large well shaped root. Carrots, beets, (except the turnip-rooted) salsafy, parsnips, and in fact all tap-rooted vegetables should have long clean roots. Carrots ought to be of a deep orange colour—those which approach to white should be rejected, as they have degenerated and will injure

the rest—the red beets should be of as deep a colour as possible. And thus we might continue our remarks on each vegetable, but the signs of degeneracy are easily distinguishable. As safe a general rule as we can lay down, is to select those of each vegetable, which possess in the greatest degree, the appearance and character we wish to perpetuate.

Cabbages, turnips, carrots, salsafy, &c. should be selected as early in the fall as it is practicable to make a good choice, and these should be transplanted at once to the spot where they are to remain, that they may firmly establish themselves and be ready in the spring to send up, and have the means of supporting a vigorous growth of seed stalks. Beets are rarely of a size sufficiently large to transplant then, and they will not do well for seed if transplanted in the spring, it is therefore advisable to mark such as are thought to be genuine, and permit them to remain where they grow. Seeds can only be obtained from those sown in autumn ; those sown in spring cannot pass through the summer. It is not, therefore, easy always to procure beet seeds, but when once had, they will keep good for many years. Radishes readily run to seed in the spring and produce an abundance of blossoms and pods, but except the earliest, it will generally be found that the seeds are imperfect. We have succeeded best when we have sown early in winter and transplanted towards spring into low ground. If the weather is severe, they will require some protection, but as not very many will be required, this can be easily afforded them. Lettuces should be transplanted, whilst young, where they are to mature their seeds, as they do not so well if transplanted when large. If, however, it be wished to save genuine seeds from particular plants, which could not be effected if left where they grow, they may be taken up with a spade, care being taken that the earth is retained around their roots To perpetuate a good variety of peas, it is not only necessary to separate them from all others, but the lower pods only should be gathered—the same remark is applicable to beans.

To save the Seeds.—All seeds keep better in their seed vessels, but this can rarely be done, on account of the great space occupied. As soon, therefore, as the pods of cabbages, turnips, radishes, &c. turn brown, and a part become

dry, the stems should be cut and laid on a cloth or floor to dry, and afterwards thrashed out, and hung up in bags in some open airy place. Lettuces should be pulled up with the *roots*, as soon as there is the least appearance of maturity, and hung up, and the plants will ripen all of their seeds, nearly at the same time—if left in the garden to ripen, the earliest and best will be lost; in fact, except under very favourable circumstances, very few will be obtained, as every shower and every strong breeze will lessen the quantity and scatter those which are mature over the whole garden. The same course should be pursued with leeks and onions.—It is a prevalent opinion that the bush squash cannot be perpetuated among us, as such have a strong tendency to run, and will in one or two seasons become a vine. This is a mistake, and has originated, no doubt, in the manner of saving the seed. If the first squashes which appear be retained for seed there is no danger of the plant running the next season, but if these be used and those which are borne at the extremities are preserved for this purpose, they will run, and moreover will be later in bearing. To have early fruit of either the squash, cucumber or melon, the very first should be reserved.

We have thus thrown together a few remarks on the culture of such vegetables, as appeared to us might to be cultivated on every plantation for general use. There are very many which are not here enumerated; not because we are unacquainted with their habits and culture, but because they do not come within the plan laid down by us, (at least for the present) for these we must refer our readers to other works.

ART. VII.—*On the Origin of Sea-Island Cotton; by* JOHN COUPER.

"St. Simons', 5th March, 1831.

Dear Sir,—Your esteemed letter of the 25th ult. is now before me, to which I shall reply, reserving the subject of your former letter for another communication.

I regretted to see Mr. Spalding's publication in the "*Georgian*," of the 31st January, respecting a letter from Patrick Walsh, Esq. agent for the Liverpool African Company, in Cuba, *to myself*, respecting the introduction of sea-island cotton into Georgia. Mr. Spalding's publication shows that he had not seen that letter, as published in the "*American Farmer*," or he would never have thrown such undeserved reflections on Dr. Mease.

Twenty or more years since, Dr. Mease visited St. Simons, with his father-in-law, the Hon. P. Butler; in conversation with them, I mentioned my letter from Mr. Walsh, and by request of Dr. Mease, gave it to him, as he was then engaged in some publication, in which he intended to notice the introduction of cotton. I heard no more of this letter, until I saw it published by request of Dr. Mease, in the "*American Farmer*," and was not a little surprised at Mr. Spalding's reply, and his want of courtesy (in his first and last sentences) to Dr. Mease. Mr. Spalding's assertion that there *is but one assertion* in Mr. Walsh's letter *that he does not know personally to be untrue*, requires my attention to the vindication of the memory of a respected friend. I have not Mr. Walsh's letter, or a copy before me, and must therefore take it up from memory.

Mr. Walsh, under date Havana, 1805—states that he met Mr. F. Levett soon after the evacuation of East Florida, (perhaps in 1783–4,) in Jamaica, at a loss how to employ his negroes—advised him to go to Georgia, and pointed out Sapalo Island as an eligible situation. Mr. Levett declined going to Georgia—went to the Bahamas—disliked prospects there, and proceeded to Georgia, probably in 1784–5. Mr. Walsh was, at the time, employed in the West-Indies, collecting seeds and plants, for his friends in the Bahamas; amongst other articles he had procured a quantity of Pernambuco cotton seed, two bags of which he forwarded to Mr. Levett: *and proceeds*—I received a letter from Mr. Levett, in 1789, saying he had carelessly thrown the cotton seed out; the season being wet, it sprouted and grew—he transplanted a part, which flourished; from that beginning he increased his seed, and expected that year (1789,) to make twenty tons of clean cotton. This is the amount of Mr. Walsh's letter, which has brought upon him the heavy charge of falsehood. As an instance, Mr. Spald-

ing says, Mr. Levett never lived a day on Sapalo. Mr. Walsh does not say Mr. Levett ever lived there—*He only advised him to do so.* I cannot conceive why a respectable man like Mr. Walsh, should write a tissue of falsehoods, on so trifling a subject. I must therefore believe what he says, to be true, and suppose Mr. Levett did write him as he states, in 1789. Mr. Spalding confuses dates—he admits that several persons planted cotton in 1789—and why not Mr. Levett. Cotton, I admit, is difficult to transplant on a large scale, and have tried to supply an irregular field, by transplanting, and *partially succeeded*, but found it better in such cases to replant with seed. I shall now drop this unpleasant subject, believing Mr. Spalding's observations were made without his having seen the letter which Dr. Mease published in the "*American Farmer;*" and that he will feel pleasure in retracting his injurious reflections.

Respecting the introduction of the sea-island cotton, Mr. Levett always assumed the merit of having done so. I never heard him mention where the seed came from,—and after receiving Mr. Walsh's letter in 1805, I never saw Mr. Levett. Mr. Nichol Turnbull, also took the merit to himself of having brought six quarts of seed from the Bahamas. I also recollect Mr. James Spalding having received seed from Mr. Kelsal. It is my opinion that the sea-island cotton found its way into Georgia, by all those gentlemen, and in the same year 1785 or 1786. My impression is, that Mr. Levett first planted cotton on *Shiddaway Island*, and removed to *Julianton*, where he died. Whether the original seed was from Pernambuco, I have no other account than from Mr. Walsh's letter. What we call here silk cotton, has been represented to me by Bahama planters as the *Anguilla.* I doubt if the Pernambuco, and other Brazil cottons are from *China* or *Kidney* seed cotton. I have no recollection of Mr. Levett planting indigo on St. Simons—part of his negroes under a Mr. Renny, planted a crop at New Hope, on the Alatamaha, I think in 1785. I drop with satisfaction this painful discussion.

You request to know the success of my plan to keep the worm from the roots of the peach. I continue, annually, in March or April, to wind bandages of cotton bagging round the lower parts of their stems. I have yet no worms in my trees. Any thing else that will keep the fly from depositing its eggs in the bark, will do as well. I have

discontinued plastering with *Forsyth's mixture*, believing it superfluous. We had a remarkable warm and mild winter, until the 21st of December, which kept the sap up, and a growth in our orange and olive trees. The severe frost that then took place, and its continuance, has injured both our sweet and sour oranges. The larger olive trees are unhurt—young plants partially cut down. This proves the olive to be a hardier plant than the sour orange.

The last two dry summers, and an injudicious choice of soil, has lessened my hopes in increasing my olives; with additional experience, I am now engaged setting out cuttings. I am, very respectfully, dear sir,

Your most ob't. serv't.

JOHN COUPER.

ART. VIII.—*Observations on Horizontal Ploughing, in reply to* WILLIAM ELLISON, *Esq.*; *by Col.* ELDRED SIMKINS, Sen.

Sir,—It is far from my intention to rejoin to the long and almost exclusively *personal* reply made to me by Mr. William Ellison, in your last number, simply because I am aware that personal controversies would lessen the value, and detract from the usefulness, of your very interesting work. By way of explaining and closing the controversy, if so it must be called, I must beg leave to remark, that you were perfectly correct when you subjoined to his article that "we certainly did not view them (my remarks) in the light in which he (Mr. E.) has, or we should have declined their insertion." Now, although I must admit that I did remark on Mr. Ellison's production in a free manner, expressing my clear dissent where I thought his positions untenable, and fairly liable to such freedom; yet I had no intention, whatever, to wound his feelings, much less to get into a *personal* controversy with him, on a subject vitally interesting to the country. I certainly regret it, if any of my *expressions* were justly calculated to rouse resentment, which certainly had slept in his bosom for a long time without my dreaming of it. Yet I still think that his remarks

were fairly liable to the dissent expressed. I did believe they were calculated to evince that he not only disapproved of the too kind manner in which the editor, *pro tempore*, was pleased to speak of my first feeble effort, but that some of his observations were calculated "to throw cold water" (if you will pardon the phrase) on a system which I then had, and still have, much at heart, and which I deemed exceedingly important to the whole middle and upper country of the Southern States.—I, of course, mean a skilful plan of horizontal ploughing. Mr. Ellison intimates that such were not his views or intentions; and I am satisfied. If I did not treat his opinions on agriculture, with the respect I did those of Mr. *Hillhouse*, it must have been because I did feel a greater deference for *Mr. H. as a practical planter of uncommon skill*, than I did for Mr. E. in that (Mr. H's.) appropriate vocation. The same superior deference I should feel for Mr. Ellison's opinions, on questions of *law*—that being his appropriate vocation. Having long believed, that he, (Mr. E.) possessed a good heart, amiable manners, and respectable attainments, I trust it is not in my nature, wantonly to hurt his feelings, or derogate from his merits, and that we shall ever hereafter be united in our best endeavours to find *a level horizontal path around the hills of all our difficulties*, and end our row in a fertile soil, and under a serene sky! I am sure, Mr. Editor, that he and you, and all considerate intelligent men, will agree with me, that the most effectual and appropriate method of preserving and redeeming that endeared soil, in which moulder the bones of our fathers, and of preventing the emigration of our children to distant wilds, are, speedily to adopt a judicious system of *manuring, rotation of crops, and horizontal ploughing.*

Your's, respectfully,

ELDRED SIMKINS, Sen.

ART. IX.—*On the Collecting of Manures, and keeping of Cattle and Hogs; by* SUMMERVILLE.

Dear Sir,—One of the great number of admirers of the "*Southern Agriculturist*," begs leave to lay before

you, a few observations, which have been induced by his own immediate observation and practice.

I have made trial of improving land by sowing two bushels of salt to an acre, but never could find any advantage from it. I have mixed salt in the compost dung-hill, at the rate of one bushel to ten cart loads of dung, at each time the compost heap was turned over, and I am certain the manure was greatly improved by the salt. During the season of the compost dung-hill rotting, a vast quantity of vegetable stuffs can be collected, and turning the heaps once or twice over, and mixing well all the ingredients completely, a valuable quantity of manure can be in readiness; if a great proportion of dry litter be added to the compost heap, such as grass, dry or green, straw of all sorts, stable manure, ashes from wood of all sorts, cow-dung picked up, and carried to the compost heap. Hog-dung, a rich and valuable manure, collected from the hog-yard, and put in the compost heap; dung of sheep to be raked up in the sheep-fold, and carried to the compost; pigeon's dung, and the sweepings of the poultry houses, to be carefully collected, and put in the compost; dung of poultry, of all sorts contains strong salts, and should be well mixed in the compost heap; human urine, oyster shells burned, clay, rotten wood, offals of the kitchen garden, mud of creeks, ponds and low rich bottoms, to be carted to the compost heap; the roots of couch grass, harrowed from dug or ploughed land, to be carted to the compost heap; this grass is the most injurious one we have in a cotton field; the roots when collected and rotted, make good manure; urine of all sorts, brine of salted meat, and salt fish, soap suds, leaves of trees, &c. All these manures to be carefully collected and put in the compost heap; a sprinkling of lime ought to be sowed among each layer of rank dung; it will make the whole rot sooner. All the farm-yard litter, such as rice-straw, hay, corn shucks, corn stalks left by horses and cattle, to be carefully collected and conveyed to the compost heap. A long shade well shingled, is proper for the compost heap, it may be open on all sides, but well shingled to prevent the sun from exhaling the great virtue of the manure. Small negroes, and those who are past hard-labour, ought to be employed in collecting all the manures, and when there is any great distance to carry them, a horse and cart cannot be employed to more advan-

tage; it is almost impossible to calculate the great quantity of manure that can be collected in a season, if properly followed up. The manuring of land is of such importance to a farmer, that he who omits it can never expect a good crop, it is the very life of husbandry, and the proper cultivation of land cannot go on without it. It is in the power of every farmer, according to ability and the range where he lives, to keep a good stock of cattle and hogs, and there is no work a negro man can be better employed at, than one to follow the cattle, and another to follow the hogs; to bring them home every evening, pen them, and immediately after the cows are milked, which ought to be by sun-rise, both cattle and hogs should then be turned out. If the care of stock was more attended to, our lands would be more improved; we would have no occasion for Kentucky hogs and cattle. The stock to be large enough to make the attendance of a minder of value; and if the pens of both cattle and hogs are properly attended, the profits arising from stock will be great. He having hinds, will prevent the stock from being destroyed by fire-hunters, negroes, and idle white people, who are inclined to kill their neighbour's stock, to get meat, rather than to earn it by honest labour. Manuring the land, is not altogether the great profit of a large stock, well regulated; but a family would be well supplied with beef, fresh or salted, and with bacon, pork or pigs, &c. as their desire directed. The stock would enable the farmer to make plenty of corn, and when plenty of grain is raised, it is no hard matter to raise plenty of hogs, by giving the hogs according to their numbers, a few quarts in the evening, when they are penned; which would keep them docile and tame, and would make them soon familiar with their minder; when he calls them in the evening to go home, they will collect around him, and follow him to their pen, and remain there till next morning, early, when the pen is to be opened, and they will all go to their rooting ground, followed by the hind, or minder.

I have seen with pleasure, the experiments and observations made by Wm. Mayrant, Esq. in number four for April last, where he makes remarks on grape vines and hops, some years back, in the life time of Mr. Rutledge, who not only was a great statesman, but an agriculturist also. Some time before Mr. R's. death, he employed me to raise grape plants, from the seeds of raisins, and from the

different sorts of grapes imported. I was successful in raising a great number from the fruit fresh imported; and the old race ground, lying between King-street road and Cooper river, was the ground pointed out for a vineyard. Death took place, and the plan dropped when in the bud. In my opinion, the best way is to raise grape vines from the seed; it is a more certain way than by importing the plants.

I have cultivated a few hills of hops for many years, for family use, in making spruce beer; they thrive well, and produce an abundance of flowers; and if I am not mistaken, the flowers are equal, if not superior, to the Northern hops. I send you a sample of them. I have a knowledge of the cultivation and management of hops; should it be requested, it will be at your service.

N. Herbermont, Esq. is deserving of the good wishes of the community at large, for his spirited engagements in propagating grape vines, and establishing an extensive vineyard. If he would be so obliging as to give your readers and his friends, a full account of the way in which he obtains grape plants, the sorts that he cultivates—if he import plants or raise them from seed, &c.; at what age he plants out the young vines from the seed-bed or nursery lines; the distance between each line or row when planted out for good in the vineyard; if he train the vines to railings or espaliers, or train them to long poles, well let down in the ground, and at what age the vines begin to bear fruit; also the distance between each plant in the rows; and to inform us also of the nature of the soil his vineyard consists of; and if he apply manure, and what quality; and the season of the year the manure is applied—with any other particulars attending on his ripe judgment and judicious management.

I regret, sir, that I cannot write on subjects, which, from long experience, I am practically acquainted with; my education is very limited; and for the want of ability in riches, I am not able to put many useful experiments into practice, which might tend to public good. I am happy, however, in contributing my mite to that great fund of knowledge, the "*Southern Agriculturist.*"

SUMMERVILLE.

ART. X.—*On the Use of Chloride of Lime as a preventative against Country Fever; by* HUGH ROSE, Esq.

Dear Sir,—The period has arrived for the performance of a promise that I made you in September, that if I escaped the country fever until the middle of November, that I would make you a communication on the use of the chloride of lime, as contributing to the preservation of health, when exposed to the mephitic air of the country during the summer. Before I enter on the explanation, it is necessary to premise, that I visited my plantation (under the culture of rice) throughout the summer, for twenty years past, generally remaining two, and often three nights—that for twelve successive years *(with the exception of the two last,)* I invariably contracted the country fever, and was several times dangerously ill, and many weeks confined to my chamber. My annual exposure to the deleterious air of a rice plantation, with a regular recurrence of fever, had made it almost a habit in my system; but I nevertheless continued to incur the risk of visiting my plantation.

In the month of June, 1829, having reflected much on the established purifying quality of the chloride of lime on animal and vegetable putrefaction, I determined to test its efficacy on the miasmata of the country, supposing that the air of my chamber might possibly be corrected by it, and rendered more salubrious. Under this impression, I procured a small jug of the chloride, and took it to my plantation about the middle of July, in the summer of 1829, when I commenced my experiment with it by putting two table spoonfuls into two saucers, (two in each) one saturated with water to a state of paste, and the other was kept dry; they remained on my mantle-piece until I retired to bed, when they were removed to my chamber and placed on each side of my bedstead, (on the floor) at the distance of three or four feet. I never replenished the saucers until I revisited the country, which was generally in the course of eighteen or twenty days throughout the summer. I experienced no fever, after June, in 1829, and I can confidently say, that my visits to the country in the summer of this year, have been more frequent and of longer duration than heretofore, and with perfect impunity. I have regularly used the chloride on each visit, with the alteration of placing the saucers on the hearth, in preference to the bed-side.

Whether my exemption from fever in the two last years, may be ascribed to the chemical properties of the chloride, or not, I am incompetent to decide; but I am disposed to think that it affords some protection in our dormitory during the hours of sleep.

Planters will recollect that the summer of 1829, was as remarkably wet, as this has been dry. As an auxiliary to the chloride, I recommend the avoidance of night air whilst in the country, and an early breakfast before exposure to the morning air. Having acquitted myself of my promise,

I remain, very respectfully,

Dear sir, your most ob't serv't,

* HUGH ROSE.

Charleston, November 16, 1830.

Should future experiments confirm those which Mr. Rose has here detailed, and the chloride of lime be found a disinfectant sufficiently powerful to protect us from the miasmata of our swamps, then indeed will a new era dawn on the maratime parts of the Southern States. The planter, no longer obliged to seek safety in flight, will be able to remain at home, and superintend, in person, all the arrangements and operations necessary for the well conducting of his plantation. The losses which we yearly sustain in consequence of our forced absence, are almost incalculable, for we are obliged to leave our crops at a most critical period, and know little or nothing of them (except by reports) during their whole growth and harvest. The evils arising from this state of things, is well known to every planter, but no corrective can be applied, unless some means be discovered to render it safe for him to remain on his plantation, or at least to visit it with impunity. Several years ago, we expressed an opinion, that the chloride of lime might be used for this purpose, but we were ignorant at the time that Mr. Rose was actually testing its efficacy. During the last summer, several planters of our acquaintance, following his example, visited their plantations, and we know of none who suffered by it—very many removed home before we had a black frost, and all who made use of the chloride, escaped, at least we have heard of none who have suffered from their early removal. It is not our intention, or wish, to induce any one to run the risk attendant on a visit to a rice plantation during the summer. Those who are not in the habit of doing so, had best remain quiet as heretofore, until the virtues of the chloride are more fully disclosed. There are many, however, who are in the constant habit of visiting their plantations at stated intervals, every summer, and to these we strongly recommend the use of this powerful disinfectant. It is so cheap,

* Mr Rose died of country fever July 16th 1831

(twenty-five cents per pound by retail) that even if used in much larger quantities than recommended by Mr. Rose, the expense would be a mere trifle. Its efficacy as a disinfectant, has been tested by various experiments, and the results have (as far as we know,) been always attended with complete success. From the many instances on record, we select the following:

"*Use of Chloride of Lime on board a Spanish fleet, in the summer of* 1829*; from the National Intelligencer, of June 5th,* 1830.—TO THE EDITORS—We have been favoured with the perusal of the reports from the surgeons of the Spanish fleet, directed to the Commandant-General of the station at Cuba, respecting the use of chlorine, which are highly interesting; affording additional evidence, if more could be required, of the extraordinary powers of that article in changing an atmosphere rendered highly offensive and pernicious to health, to one devoid of effluvia, and perfectly salubrious.

"On the 11th of July last, the fleet destined for the invasion of Mexico, conveying, in addition to the usual compliment of mariners, a large number of soldiers, was overtaken in the gulf of Mexico by a violent tempest, which continued for several days. The severity of the storm rendered it necessary to remove the windsails, and to close, not only the ports of the lower gun deck, but likewise those of the main deck, and to place on the hatches. In this condition of the ships, with such a crowd of persons confined together, in the middle of summer, within the tropics, without fresh air, putrid fever and malignant dysentery soon made their appearance. The air is described as possessing, in addition to a highly offensive effluvium, an acrid heat, burning to the skin, with a degree of density that arrested respiration and produced giddiness.

"At this moment of distress and anxiety for the safety of all on board, the chlorine was used with the most decided and happy effects. Twelve vessels, containing one ounce each of the chloride of lime, in solution with water, were suspended on the birth deck, four were placed on the orlop deck, and two in the gun room. In the space of two hours, the atmosphere lost all its deleterious qualities, and became perfectly agreeable, leaving nothing perceptible but the smell of tar which always exists more or less in ships. The solutions were renewed every twenty-four-hours; but the chlorine, undissolved, at the bottom of the vessels was then sprinkled on the decks, and thrown into such vessels as it became necessary to cleanse. During the whole of the campaign, which lasted three months and a half, the atmosphere was preserved in this pure state by the chlorine, to which all the surgeons unite in attributing the very few instances of death that occurred in the fleet, when there existed such fruitful sources of fatal disorders.

"In these reports we find the experiments of Labarraque confirmed. Putrid meat, immersed for two hours in a solution of one part of the chloride of lime with forty parts of water, after being several times washed in fresh water, lost its disagreeable odour, and became as agreeable to the taste as if no putrefaction had ever taken place. It is likewise added, that the chloride never incommoded, in the least, the healthy or the sick. Two cases of pulmonary consumption were particularly noticed, in which not the least irritation of the lungs could be perceived.

"While inviting public attention to the signal virtues of the chlorine, it should not be confounded with the disinfecting gases of Morveau and Carmichael Smith, so much condemned in Trotter's Medicina Nautica.*—B."

Our readers must bear in mind, however, that the use of chloride of lime in the chamber, cannot do away the ill effects arising from exposure to night air, rain, &c. If these are undergone, the penalty must be endured. The utmost caution, therefore, should still be used, and above all things, let not those who shall test its virtues, and experience its efficacy, so far forget the nature of our climate, as to act as if living in a healthy one, or as if they bore a charmed life, proof against the fevers and other diseases incident to a Southern climate.—[*Editor.*

ART. XI.—*Corrections.*

"Camden, 26th February, 1831.

Dear Sir,—Intending to see you when I was in Charleston, I have delayed correcting a few mistakes in your January number, on "Manuring, Enclosing," &c. They are as follows:

Strike out "cut," and insert "but," in the 13th line of page 2.
Strike out "oily," and insert "belly," in the 24th line of page 3.
Insert "in the usual large pile" between "than" and "at" in the 21st line of page 4.
Strike out "evening," and insert "working," in the 4th line of page 5.
Strike out "cropping," and insert "crossing," in the line next to the bottom of page 5.

The insertion required is from my mistake, the rest are yours; and they are noticed because they are necessary to make me understood.

A PLANTER.

* The quantity of the chloride of lime proposed to be furnished to a ship of the line, by the Spanish surgeons, in their report, is fifteen pounds a month, which in this city would cost about two dollars.

PART II.

REVIEW.

ART. I.—*A Treatise on the Breeding, Rearing, and Fattening of Poultry.* London. 1819.

(Concluded from page 209.)

Very little remains for us to notice, which will prove interesting to the practical farmer, who values such information by the use which he may be able to make of it, but those who are curious in such matters, will find much to engage their attention, which want of room compels us to pass by, or notice only in part. Following the order laid down in the Treatise, we come next to the "developement of the fœtus in the egg," of which much is said, and several authors referred to—for the gratification of those who may wish to know the progress of the fœtus, without ascertaining it by actual experiment, we select the results of Haller's observations, as here given.

"1st. That at the end of twelve hours, a commencement of organization is already perceived in that spot which is called *cicatricule*, and which we have said was placed on the globe of the yolk, and always to be found, by a peculiar mechanism, at its upper part, in whatever situation the egg is in, to the centre of which this globe is suspended.

"2d. That the parts of the fœtus which were invisible before incubation, on account of the exiguidity of their fluidity, and of their transparency, gradually acquire the consistence which suits them, so that those which are to be solid, as the bones for instance, become gelatinous, membraneous, cartilaginous, before they become bony.

"3d. That in developing themselves, some rather sooner, others rather later, according to their importance in the organization of the chick, they lose, more or less hastily, their transparency, and come into shapes and situations by which they may be known. Therefore they do not become discernible but at different times; the first day the head and spine can be distinguished; the second, the vertebræ and the heart; the third, the neck and breast; the fourth, the eyes and the liver; the fifth, the stomach and loins; the sixth, the lungs and skin; the seventh, the intestines and the bill; the eighth, the gall bladder and the ventricles of the heart; the ninth, the wings and thighs; the tenth, all the parts which are to constitute the chick are in their places; they then have the form which characterises them. On the following day they develope, and come to the full size they are capable of attaining; the chick is then strong enough to break his shell, which he does on the twenty-first day after incubation."

Much more is detailed, but we must refer our readers, who may wish such information, to the Treatise, and the authors

referred to in it, whilst we proceed to the management of young chickens.

"It is commonly the twenty-first day of incubation that the chickens break their shells, and issue from their prisons. Some perform this operation easily enough, or at least, quickly enough: others experience more difficulties, either on account of the shell, which the latter attack, being harder, or because their bill is weaker than those of their comrades.

"On that day the setters must be attentively watched, and one must be in readiness to help the chickens which have not strength enough to make a sufficient aperture in the egg, or which are left sticking to the shell, by the remains of an albumen which has thickened; but this emission of the chickens is so much the less dangerous to them, as it is natural and not forced. It should then only be facilitated, but in the utmost danger, when, after some useless efforts, the chick is reduced to inaction; the greatest dexterity should then be employed to help without hurting it; for the least scratch would kill it. The weak ones are strengthened by wetting their bill with warm wine, sugared, which gets into their mouths when they open them, and they then swallow a few drops.

"The day of their birth, chickens do not want to eat; they are left in the nest. They are taken on the morrow under coop, a kind of large basket, lined inside with tow, and they are fed, as also on the following days, with crumbs of bread, soaked either in wine, to strengthen them, or in milk, to give them an appetite; if they are loose, the yolks of eggs are set before them. Very clear water is laid for them fresh every day, and now and then they must have some chopped leeks. After having kept them cooped up warmly under this coop, during five or six days, they are turned out a little in the sun, towards the middle of the day, and they are fed with boiled barley, millet, mixed with curdled milk, and a few pot herbs chopped up.

"At the end of fifteen or eighteen days, the hen is allowed to lead her little ones into the poultry-yard; but as she is then able to manage twenty-five or thirty, those of another hen are added to hers; and the other one is put back again to set or lay.

"The inducements for choosing one of these hens from the other, for giving them the management of chickens, are a full sized breast, and a great compass of wings, in order that they may still experience the useful influence of a second setting."

The common practice is to set hens as fast as they are willing to do so, and to give to each only the chickens hatched by them; but this is bad economy. A hen will protect and provide for many more chickens than she can hatch, and it ought to be so managed, that one may have all of those which are hatched by several, and these can be again employed in setting and bringing forth successive broods. No attention ought, therefore, to to be paid to the desire of a single hen, but the house-wife should wait until several are willing, and then set them all together; by following this practice she will have a large number of chickens, which can be apportioned to as many hens as may be necessary, and the others be again used for the same purpose. The plan followed by a friend of ours, is to set five or six hens at the same time; when they have hatched their eggs, all of the chickens are given to one hen, and the remaining hens are set over a fresh parcel of eggs. When these come out, the chickens are again given to one hen, and the others placed once more over a fresh

supply of eggs. The utility of this practice is so obvious, that the only inquiry we suppose, will be, can this be effected without injury to the hens. It may appear unnatural and cruel. but we are assured that no evil results from the practice—and that the hens perform their parts willingly, and if well attended to do not suffer. Another gentleman of our acquaintance, who is uncommonly successful, has pursued this plan for many years, and has set the same hens as often as five times, in succession, without injuring them, and he believes no ill consequences will ensue from this practice, *provided "they are well fed, kept perfectly clean, and free from vermin."* The house, of course, should always be properly ventilated, and too much care cannot be taken to remove all filth, and whatever may cause a noxious effluvia, as soon as possible. Turkey hens are often successfully employed in hatching chickens, but if used for this puspose, the chickens ought to be taken from her, and given to a fowl to rear, for the turkey is of too rambling a disposition, to take care of chickens, and will give them a habit of straying from the farm yard, which is not desirable.

Some little is said of the making of capons, and educating them for setting and leading chickens. The common process, for the latter purpose, is too cruel for the age we live in. It consists of plucking the feathers from the belly, rubbing it with nettles, making him drunk, and cooping him up in a close place—this to be repeated several times. He is taken from thence, and a few chickens are given him at first, and others afterwards added. But Reaumur was opposed to this, as cruel and unnecessary.

"He has thought, and has proved, that it was sufficient to put him singly at first in a tub, not very broad, but pretty deep, to cover it over in order to let him have but little light, to take him two or three times a day out of the tub to put him under a coop, where he found seed, then to give him two or three chickens, which are taken and fed with him under the coop, to get him used not only to bear these, but further to receive others, whose number was successively increased till forty or fifty, as in the first mode, and which he lead the same."

A rather long and tedious account of the modes of fattening poultry, is followed by an historical account of the artificial hatching of chickens; which it appears was first brought into notice in the days of Augustus. The Egyptian hatches, or ovens for hatching of chickens, have long been celebrated, and Reaumur attempted to introduce into France, (not the Egyptian mode, which he thought defective,) but two of his own, which he supposed would prove more convenient, and less costly, than the Egyptian. He succeeded pretty well, but so many inconveniences attended the process, that none have followed it since his death. Artificial incubation, has not, however, been abandoned, and many have attempted it by various processes, and we have

here those pursued by Reaumur, Copineau, Duboise, and Bonnemain, besides an account of the Egyptian mode, in full. We will not say that none of these have succeeded in Europe, but certain it is that none have been brought much into notice, and they have, one after the other, fallen into disuse. Some others may yet, however, be found, and if an opinion may be ventured, we would suggest that steam passed into a bed of stones, as has lately been done in one of the hot-houses of the Caledonian Horticultural Society, will be found to be the best as well as the most convenient mode of effecting this purpose; less attention will be required, and the heat given out by this heated mass of stone, will be more uniform and lasting, than any of the processes hitherto used, with which we are acquainted.

For a more detailed account, and many interesting particulars, we are compelled once more to refer our readers to the Treatise itself, whilst we take leave of the subject.

SELECTIONS.

Art. I.—*Letter from* F. Henderson, *On the Culture of Sugar, addressed to the* Secretary of the Treasury.

"German Coast, 25th September, 1830.

Sir,—I have the honour to acknowledge the receipt, on the 11th August, of certain inquiries, which you desire me to answer, with a view to prepare a manual containing the best practical information on the culture of the sugar cane, and the fabrication and refinement of sugar, agreeably to a resolution of the House of Representatives at their last session. Upon a careful, thorough, and fair investigation of the subject, based on my experience alone, the following are my answers to those inquiries:

First. The names and description of the several species or varieties of sugar cane, with a statement of their habits and qualities as to soil, climate, &c.

Answer. There are four varieties of the sugar cane in general use in Louisiana—the purple and green ribbon, the Otaheite, and the Creole or Brazil cane. The two last mentioned varieties make the best sugar, and upon good ground the most certain crop. The Otaheite grows larger than the Creole cane, but it has to be replanted every year, as it hardly ever grows well from

the stubble. They are both alike liable to be injured by early frosts.

In new, rich and alluvial land, the Creole cane need not at first be replanted more than once in three or four years, and the red ribbon once in five or six; but this mode of cultivation exhausts the land; and, if persevered in, would soon render it unfit for the cultivation of the cane. The best and most successful planters on the Mississippi, seldom suffer the same land to remain planted in cane more than two years; afterwards, they plant it in corn, or let it rest, shading it from the influence of the sun with peas and beans of different sorts. The red ribbon cane is the largest of the four varieties mentioned; it is generally planted in lands newly cleared, and produces sugar the first season, where other cane would only produce molasses; it is a strong and durable plant, seldom affected by early frosts, and can be cultivated on the margin of water courses as far as the 31st degree of north latitude; but the pulp of this cane being extremely hard, it requires a steam-mill to grind it; and the sugar made from it, compared to the sugar obtained from the other varieties mentioned, is always of an inferior quality.

Second. The highest latitude and coldest temperature in which the sugar cane produces seed.

Answer. There is no part of Louisiana in which cane produces seed, except a few parts among the islands, between latitude 28 and 29; but cane planted in rich or in alluvial soil on the margin of water courses, which protect it from the effects of the frost, will ripen sufficiently to make sugar any where between latitudes 28 and 30 or 31, if it be ribbon cane. For the better understanding of this answer, it is necessary to know that the cane stock does not ripen all at once, but begins to ripen near the ground; so that the lower part of the cane is fit to make sugar several months before the cane has attained its growth. In the islands above mentioned, where the frost is not felt, it is suffered to ripen to the very top; but with us, whatever be its state of maturity, we are compelled, in order to save our crops, to begin cutting it down in the latter part of October, cutting off and throwing away the unripe tops, which are always a considerable proportion of the cane, and sometimes more than half of it. It is perceptible that, as you go north, the cane ripens less in the same length of time; and I believe that the advantage of climate and the chances of saving a crop between the southernmost and northernmost points at which sugar is now cultivated in Louisiana, are at least 50 per cent in favour of the former. The neighbourhood of the sea is very beneficial to the growth of the cane and the quality of the sugar.

Third. The best method of preserving the vegetating principle of cane-cuttings on long voyages.

Answer. You may cut down the cane from the middle of September until frost, and put it up three or four acres together, in such a manner that the part of the cane which is ripe be well covered by the tops; this is called putting it up in *mattelasses*, and ought to be done, if possible, in warm weather, or in the morning when the plant is wet with the dews, which are always heavy in these climates at that season of the year. If the cane has been put up in mattelasses, the loose straw may be shaken from them in winter; and, in this state, they can be transported on a voyage of two months, by keeping the frost from them, and giving them air and moisture. They may, also, as soon as they are cut down, be stripped of the straw, and packed in barrels or hogsheads; and, in that state, be transported safely on a voyage of two months. The ground ought to be prepared and ready to plant as soon as they arrive.

Fourth. The latitude and temperature of the coldest climate in which sugar cane has been advantageously cultivated.

Answer. From 29½ to 30° latitude north: some persons have lately begun to cultivate the red-ribbon cane on the Red River, as far north as 31°, and the experiment has been thus far successful.

Fifth. The best mode of cultivating the cane.

Answer. If the soil is alluvial, it ought to be well ditched, so that the cane may always be two or three feet above the level of the water in the ditches. According to the quality of the land, the cane ought to be planted from two to four feet apart, allowing the greatest distances in the richest soil; it is laid in drills made with a common plough, lapped only if the land is new, and if it has been long in cultivation. The cane is afterwards covered sufficiently to preserve it from the frost and ice. You may plant at any time from the middle of September to the first of March. The fall planting I look upon as the safest and best, because, in case of a cold winter, the cane is safer in the ground than in mattelasses; and further, because a great deal of the fall planting may be done with the cane-tops, which are otherwise thrown away.

Sixth. The best method of making sugar from the cane.

Answer. There is but one method yet in general use in Louisiana to make sugar from the cane. After the juice has been expressed by means of a horse or steam mill, it is boiled in four or five kettles of copper or iron, skimming it as it boils, to rid it of the impurities which it contains as they come to the surface, and throwing into it a sufficient quantity of slack-lime to neutralize the acid which is always found with it. The length of time of boiling, and the quantity of lime used, vary every day, according to the quality of the juice, and must be left to the judgment of the sugar-maker; if too much lime is used, an excess of alkali will remain after neutralizing the acid, and the sugar will be black; if, on the contrary, the acid is not entirely

neutralized, the syrup will not granulate. When the cane-juice weighs 70 lbs. or upwards, by the common *pise sirop*, it is not difficult to make sugar; but when the cane is unripe, blown down, or spoiled in the field by frost, and subsequent fermentation, it requires a great deal more lime and boiling; and, without the greatest care, the syrup will not granulate.

A *batterie* of four or five kettles, well supplied with cane-juice, will give from 5 to 10,000 pounds of sugar every twenty-four hours. The work, to do this, must go on day and night, and without any accident.

In this answer, I have mentioned *sugar-makers*. They are men who follow that occupation as a trade. Every planter is compelled to employ one; and their wages are from one to two dollars per hogshead of one thousand pounds, according to their reputation and skill.

Seventh. The latest improvements in making sugar from unripe cane, noting the advantages and disadvantages.

Answer. There is, thus far, very little improvement in making sugar from unripe or spoiled cane; several planters will attempt it this year by the process of William A. Archbald, for the use of which they have paid him a large bonus. Another man, a sugar-maker from Jamaica, has offered to do it in a different manner; and his method will also be tested this fall. Without pretending to foretel what the result will be, I must be permitted to say, that I have no sort of confidence in those projects. Some good may, however, result from the experiments that have been, and are intended to be made. The boiling by steam, which is a part of them, would, of itself, be a great saving of fuel, which is now very scarce on many of the plantations bordering on the Mississippi. The common price paid for it by the planters who are obliged to buy it, is from three to three and a half dollars per cord; it takes from two to two and a half cords per hogshead of one thousand pounds, and the engine consumes about one cord more per hogshead. Stone coal is now made use of by many for the steam engine; it is cheaper, and a great deal better than wood, although it has not yet got into general use; it is brought down from Virginia and the Western States, and sold here at from fifty to sixty cents per barrel. I use about three thousand barrels a year on two estates, and I find it cheaper to buy it, at the above prices, than to cut wood in the swamps, and carry it with boats and carts to the sugar house. I am of opinion that in five years two hundred thousand barrels of coal will be consumed on the plantations which border on the Mississippi. This is, therefore, one of the many advantages resulting to Virginia and the Western States from the American System. The coal with which their mountains abound, cannot bear the cost of transportation to any other country. Louisiana will ever be as

good a market for it as for corn and provisions, and the quantity wanted will increase every year.

Eighth. The average quantity of sugar which may be made from a given quantity of land, of proper quality, in the various places in which cane is cultivated.

Answer. Let us suppose a plantation containing seven hundred and fifty acres of land (sugar) well ditched, and in a high state of cultivation, between latitude 29 and 30: five hundred acres of it would be planted in cane, and the remainder in corn or beans: of the five hundred acres of cane, two hundred would be plant-cane, two hundred first-year rattoon or stubble cane, and one hundred second-year rattoon cane; the last hundred acres, being generally thin, small, and short jointed, would be put up in mattelasses for plant. The remaining four hundred acres would be converted into sugar; and one hogshead of a thousand pounds, per acre, would be considered a good average crop. Four hundred thousand pounds of sugar would then be the average crop of an estate containing seven hundred and fifty acres of sugar land of the best quality, it being five hundred and thirty-three pounds to the acre. The corn and beans raised are given to the slaves, and are not sufficient for them one year in ten.

Ninth. The number of hands required to cultivate a given quantity of land planted with cane, and to perform all the labour necessary in the manufacture of sugar, in the different places where it is made; and the estimated expense of making a given quantity, and putting it up for market, in each or either of these places, including boxes, casks, or hogsheads.

Answer. The number of hands required to work the plantation mentioned in the foregoing answer would be one hundred field hands. This, with the old and young, the mechanics, and those employed to take care of the sick, and to mind the cattle and horses, supposes a plantation of one hundred and fifty or sixty slaves. The average crop made by them would be, as above stated, four hundred thousand pounds of sugar: supposing that it should sell all around on the plantation at 5½ cents per pound, it would yield twenty-two thousand dollars. The proportion of molasses to this quantity of sugar would be, at most, twenty thousand gallons; which, supposing it to sell on the plantation at 18 cts. would give the additional sum of three thousand six hundred dollars, making the gross amount of the crop twenty-five thousand six hundred dollars. The annual expense of such a plantation would be about ten thousand dollars, in the following items:

Overseer's wages - - -	$1,500 00
Sugar-maker's wages - - -	500 00
Engineer's wages - - -	400 00
Corn and flour - - -	1,000 00
Stone coal - - - -	600 00

Fresh and salt provisions, and whiskey -	1,500 00
Clothing for the slaves, and the hospisal -	1,400 00
Physician and medicine - - - -	500 00
Hoops for the hogsheads and casks - -	100 00
From ten to fifteen horses, and as many pair of oxen, every year - - -	1,500 00
Wear and tear of farming utensils, tools, &c. -	600 00
For lime, oakum, planks, nails, &c. - -	400 00
	$10,000 00

This estimate of expense is made on the supposition that the planter pays no freight; that he makes his own wood, all his fences, his levee, his casks and hogsheads, all his wood and iron work, and a large quantity of corn. Deducting the expense, the nett proceeds of the crop would then be fifteen thousand six hundred dollars. An estate of that size, with a due proportion of low land, the slaves and every thing thereto belonging, situate on the banks of the Mississippi, between latitudes 29 and 30, is worth, and would cost, if well improved, from two hundred and twenty-five thousand to two hundred and fifty thousand dollars.

The foregoing estimate will show that on a plantation well managed and worked, with the best land, and in the most favourable situation, the actual expense incurred in making sugar in Louisiana is one dollar for every forty pounds, or $2\frac{1}{2}$ cents per pound; and that, at the present prices, such an estate will not yield more than 7 per cent. of its value, whilst the conventional interest of this State is ten per cent.

I wish it understood that I do not give the above average as that of the State of Louisiana generally: for if every one hundred and sixty slaves gave four hundred hogsheads of sugar, the average crop of Louisiana, say eighty thousand hogsheads, would be cultivated with thirty-two thousand slaves: the census of 1830 will show more than double that number employed in the cultivation of sugar in the State of Louisiana.

I have owned cotton plantations in that part of Florida which was attached to the State of Louisiana for more than twenty years: I find it even now as profitable as sugar, and I have never thought of changing the cultivation. Could cotton be raised in the southern part of the State as well as on Red River, the cultivation of sugar would, I apprehend, have increased with much less rapidity than it has done.

Very respectfully,

Your obedient servant,

F. HENDERSON.

Art. II.—*Celeriac, or Turnip-rooted Celery.*

We are not able to give any instruction for this vegetable, drawn from our own experience. Nor do we know of its having been cultivated in the Southern States. In all the articles we have read respecting it, it is stated that the time of sowing is the same as for the common varieties of celery; and this we think will serve as a sufficient guide in our attempts to cultivate it among us. Its culture differs somewhat from that of celery, and we select from "McIntosh's Practical Gardener," the directions which we give below.—[*Editor.*

"*Celeriac, or turnip-rooted celery*, is much hardier than any of the other sorts, and will continue longer in spring. It is often imported from Hamburg for the London market, and is universally cultivated on the continent. The seeds should be sown, and transplanted, as has been directed for celery, only they should be sown thinner, and a greater supply of water given to the plants in all the stages of their growth.

"The following is the method of cultivating this vegetable in Denmark, according to the system of Mr. Jens Peter Petersen, and communicated to the Horticultural Society by W. Atkinson, Esq. F. H. S.

"'Celeriac requires a light, moist, and rich soil. It is essential that the dung be perfectly decomposed. For summer and autumn crops, sow the seed towards the end of February, very thinly, on a moderate hot-bed, in good rich mould. When the plants appear, they must be inured as much as possible to the open air, and thinned so as to stand one inch apart from each other, and always kept moist. Transplant about the middle of May, or when the plants are four inches high. The roots will be fit for use at the end of July. For a winter crop, sow about the end of March, on a rich warm border; when about an inch high, thin and keep them moist. In June, they will be fit for transplanting: this is to be done on flat beds, four feet wide; four drills are drawn four inches deep, in these the plants, after some of the roots and tops of the leaves are cut off, are put in at the distance of one foot apart, watered and kept so, if the weather be dry. When grown to half their size, which will be about the beginning of August, a small quantity of the mould round the root of each plant must be removed, taking care not to disturb nor expose the main root. Cut off all the side roots and the large coarse leaves close to the plant, levelling the mould to each as you proceed in the work. When the whole is completed, the bed must be sufficiently watered.

"'Celeriac may be considered as a bulbous variety of celery, and therefore, to be eatable, it requires to be blanched; for

which purpose, it must be earthed up to a certain extent, but the less, the better.' "

In a former number we published directions for dressing it, but for the benefit of our new subscribers we here republish it:

" *To dress the roots of Celeriac or Celerie Rave.*—The following is considered a cheap and an elegant mode:—Pare the roots, and cut them into slices somewhat less than a quarter of an inch in thickness; then boil them gently till they are tender in some broth, or in water well seasoned, and a slice of butter added. When dished, pour over them some melted butter, or *bechamel* sauce, which is made by thickening some broth, and adding a little cream. Celeriac is cultivated at greater ease and at less expense than the common celery, and it may be used in the kitchen for seven or eight months in succession."—*Gard. Mag.*

Art. III.—*On Cheese Making.*

[from the genesee farmer.]

The preparation of rennet is one of the first operations in cheese making, and the flavour of the cheese depends very much upon the manner in which it is prepared. For this purpose, the stomach or maw of some ruminating animal, is made use of, and that of a young calf is preferred by the best dairy women. Various opinions have prevailed at different times with regard to the use of rennet. The Jews made use of the juice of plants for coagulating milk for cheese making, as the use of rennet was strictly forbidden by the Mosaic law. The Dutch cheese of commerce is made by coagulating the milk with muriatic acid, which combining with animal alkali, contained in the milk, forms muriate of ammonia, and it is owing to the presence of this salt, that Dutch cheese has such a sharp pungent taste, like the sal. ammoniac of the shops. When the stomach of a young calf has been taken out, which is intended to be used as rennet, the contents should be emptied out, and the bag washed very clean, and laid down into a stone jar, or some other convenient vessel, and covered with a strong brine.

It is the custom of some to save the coagulated milk or curd, contained in the stomach, when the calf was killed; but it is found extremely difficult to keep it sweet, and therefore it is now neglected at most dairies. When the maw has been about four days in the brine, it should be taken out and drained, and put into a new brine, sufficient in quantity to cover the maw; in which, there should be put, at the rate of one lemon, and one

ounce of cloves, to four maws. After the rennet is thus prepared, it should be kept closely covered, so as to exclude the air as much as possible; a stone jug of sufficient size, is well calculated for containing it during summer, which may be closely corked.

Rennet which has been kept in this manner one year, is found to be better than such as has been newly prepared.

In whatever way the rennet is prepared, it should be done before the season for cheese making commences, in sufficient quantity for the season. It should all be prepared in one vessel, that the whole quantity may be assimilated in strength as well as flavour. One very great defect in most of our small dairies, is a want of uniformity in the quality of the cheese, and with large ones that we have never adopted any particular standard for quality, which should be known in market by a particular name.

In England, cheese making is reduced to a system, and the *kind* of cheese to be made being decided upon, the particular process for that kind is pursued; and the cheese are produced with as much uniformity, as our bakers make their bread from the same flour; and thus cheese are known from one end of the kingdom to the other, by name; and a person wishing to purchase of any given variety, can send for it with as little danger of being deceived, as there would be, if he sent to the bakers for a loaf of brown bread or a loaf of white.

Now this uniformity of quality, which should be known by name, in our market, is what is wanted to make our cheese compare with any in the world, as no country produces finer or richer pasturage for cows. The first great step towards this, is the careful preparation of the rennet, to have an article of the same strength and flavour through the whole season; and this can only be done by having it all prepared together, before the season commences. This is so important a part of the process, that it should never be trusted to unskilful hands.

It is a very common practice for dairy women to send to the butchers and purchase dried maws. This is risking the produce of the dairy, as it is next to impossible to tell, after the maw has been dried, whether it was carefully done: and if not, no after process can restore it. And if the rennet is bad, the most skilful operator cannot produce good cheese with it. If you have not sufficient maws in preparation for the season, they should be purchased of the butcher, when first taken out, and prepared under your own direction. It has been practised by some, to make use of the stomach of hogs, as a substitute for those of calves. But this should never be done, where those of calves can be procured, as cheese made from them is very apt to have a strong, rank, disagreeable flavour, unless there has been uncommon pains in preparing them.

But let every dairy man and woman remember, that after the rennet is well prepared, and the milk is in readiness, that unless there is a uniformity of process, there will not be a uniformity of product. In the first place, the greatest attention is necessary as to the quantity of rennet to a given quantity of milk. This should always be determined by weight or measure—then the temperature at which the rennet is added. This should never be left to the vague manner of being determined by the hand, but by a thermometer. A thermometer is as essential in this process as in brewing or distilling; and we should pronounce that brewer or distiller mad who attempted to scald his grain without one.

Art. IV.—*Laying out Farm Lands.*

[FROM THE NEW-YORK FARMER.]

In arranging farm lands, the principal consideration is the size and shape of the fields, and the next, access to them and to the farmery by proper roads.

With good private roads, a farmer will perform his operations at much less expense, the labour of the horses will be much easier; a greater quantity or weight of grain and other articles may be more expeditiously carried over them; manure can be more easily conveyed to the fields; the harvest can be carried on more rapidly; and wear and tear of every description will be greatly reduced.

The form and size of fields, have too often been determined without much regard to the size of the farm, the exposure and the equability of the soil. This is the more to be regretted in the case of live fences, which ought to endure for a long course of years, and which cannot be eradicated without considerable expense. In *The Code of Agriculture* it is observed, that "when a whole farm is divided into fields of various sizes, it is difficult to form a plan, so as to suit a regular rotation of crops, or to keep very accurate accounts. Whereas, by having the fields *in general* of a large size, the whole strength of a farm, and the whole attention of the farmer is directed to one point; while an emulation is excited among the ploughmen, when they are thus placed in circumstances which admit their work to be compared. Some small fields are certainly convenient on any farm, for grazing and other purposes, to be afterward explained. On elevated situations also, the shelter derived from small enclosures, is of use.

A number of small enclosures, irregularly shaped, surrounded with trees or high hedges, in corn farms, and more especially in corn lands, situated in a flat country, where shelter is unnecessary, is exceedingly injurious to the farmer. Besides the original expense of making the enclosures, the injury done to the crops of grain, produced by the want of a free circulation of air, and the harbour afforded to numbers of small birds; the very site of numerous hedges with their attendant ditches, and the uncultivated slips of lands on both sides of them, consume a much larger proportion of arable land than is commonly imagined. Hedges, especially if accompanied by rows of trees, greatly exhaust the ground of its fertility, nourish weeds, the seeds of which are widely disseminated, and, by the exclusion of air, the harvesting of the crop is carried on more slowly. Even upon meadow lands, small enclosures, encircled by hedges, are injurious, as they prevent the circulation of air for making or drying the hay. Small enclosures, with high hedges and trees, are extremely injurious to the roads in their neighbourhood.

With fields of a considerable size, less ground is wasted, and fewer fences are to uphold. The crops of grain being more exposed to wind, can be harvested earlier, and it suffers less from damp seasons. Small enclosures in pasture are more productive in winter, being better sheltered; but in summer the larger and more open the enclosures are, the better; for in hot weather both cattle and sheep resort to the most airy places. It is easier also, when they are in pasture, to obtain a supply of water in large fields than in small ones; indeed fields are sometimes so small, that it is very difficult to procure an adequate supply of water, even in winter. But the conclusive argument in favour of large arable fields is this, that where fields are small, much time and labour are wasted by short turnings; and it is now ascertained, "that if fields are of a regular shape, and the ridges of a proper length, five ploughs may do as much work as six ploughs in fields of a small size, and of an irregular shape; while every other branch of labour, (such as dunging, sowing, harrowing, reaping, and carrying in the harvest,) can be executed, though not altogether, yet nearly in the same proportion."

The circumstances on which the size of fields ought to depend are, the extent of the farm in which they are situated, the nature of the soil and subsoil, the rotations adopted, the number of ploughs on the farm, the inclination of the ground, its being in pasturage or otherwise, and the nature of the climate.

Soil and subsoil. In dividing a farm into fields the nature of the soil and subsoil ought to be kept in view. Where the soil is various, it would be proper to separate the light from the heavy. They are not only better calculated for different crops and different rotations, but are naturally adapted to be cultivated at

different seasons. It is unfortunate, therefore, to have soils of a heterogeneous nature mingled in the same field. But where this partially takes place, for instance, where there are only one or two acres of light soil, to ten or twenty of strong soil, let the following plan be adopted :—At any slack time, either in summer or winter, more especially when the field is under fallow, employ two carts and horses with four fillers, to cover the acre or two of light soil, with the strong soil contiguous, and the soil in the field will then become more uniform.

The rotation adopted. It may be considered as a good general rule, to divide a farm according to the course of crops pursued in it; that is to say, a farm with a rotation of six crops should have six fields, or twelve, according to circumstances. It is proper to have a whole field, if the soil be uniform, under one crop; and every farmer of experience knows the comfort of having the produce of the farm as equal every year as the soil and season will admit of.

Number of ploughs. It is likewise proper that the size of the fields should be somewhat in proportion to the number of horses and ploughs on the farm. When the fields are of too great an extent, in proportion to the stock kept, a considerable interval must occur between the sowing of the first and last part; and it will in general be desirable to have each field cleared at the same time in harvest. The harrowing also is done more economically, when the field is sown at once, than in several portions; and where rolling is required, that operation being most effectually done across, it cannot well be accomplished till the field has been completed

Inclination of the ground. It is, however, evident that the size of the fields must in some respects depend on the flatness, or the hilly shape of the ground. Even on dry land, if there be a rise on the ground, from fifteen to twenty chains is sufficient length; for if the ridge be longer, the horses become much fatigued if compelled to plough a strong furrow up hill beyond that length in one direction. This objection, however, to large fields, may in some measure be obviated, by giving the ridges and furrows in such fields as are on the sides of a hill, such an obliquity as may diminish the difficulties of the ascent.

Climate. The last circumstances to be considered in determining the proper size of fields, is the nature of the climate. In dry and cold climates, small enclosures are desirable on account of shelter; whereas, in wet countries the fields under culture cannot be too open and airy for the purpose of drying the ground, of bringing forward and ripening the grain, and of enabling the farmer more easily to secure it during an unfavourable harvest, by having a free circulation of air. But though on large farms, fields should in general be formed on an extensive scale, yet there is a convenience in having a few smaller

fields near the farm house, for keeping the family cows; for turning out young horses, mares and foals; for raising a great variety of vegetables; and for trying experiments on a small scale, which may afterwards be extended, if they shall be found to answer. Where enclosures are too large for particular purposes, and where no small fields, as above recommended, have been prepared, large fields may be subdivided by sheep-hurdles, a sort of portable fence well known to every turnip-grower. In this way, great advantage may be derived from the constant use of land that would otherwise have been occupied by stationary fences; and the expense of subdivisions, which, on a large farm, would necessarily have been numerous, is thereby avoided. This fence is perfectly effectual against sheep, though it is not so well calculated for stronger animals. On dry soils, where sheep are generally pastured, it is not unlikely that by using moveable hurdles, the expense of permanent fences might in a great measure be saved.

Square fields. The advantage of having the fences in straight lines, and the fields, when large, of a square form, is unquestionable, as the ploughing of them, under this arrangement, can be carried on with much greater despatch. Some farmers, whose fields are of a waving or eneven shape, and who enclose with hedge and ditch, carry their fence through the hollows or best soil, with a view of raising a good hedge, thus often sacrificing, for the sake of the fence, the form of their field. A straight line, however, is preferable, even though it should be necessary to take some particular pains to enrich the soil for the hedge, where it is thin and poor, on any elevation.

Oblong fields. When fields are small, an oblong shape should be preferred, that the ploughings may be performed with as few turnings as possible. This form has also other advantages. The fields are more easily subdivided, and water can in almost every case be got, by making proper ponds in the meeting or joining of three or four fields, whose gutters or ditches will convey water to the ponds. In turnip soils, where the shape is oblong, it is easier to divide the turnips with nets or hurdles, for the convenience of feeding them off with sheep. If the ridges are too long, and the fields dry and level, the length may be reduced by making cross head-lands, or head ridges, at any place that may be considered the fittest by the occupier.

ART. V.—*A method of increasing the size of Fruits; by* M. JAUME SAINT-HILAIRE.

[FROM THE AMERICAN FARMER.]

Amateurs of beautiful fruits, will doubtless read with pleasure, the experiments made by M. Jaume Saint-Hilaire, for increasing the size of pears, which are described in a memoir, read by him, on the 5th of November, 1829, before the Societe Royale et Centrale D'Agriculture.

On examining the espalier pear trees, in the nursery of the Luxembourg and in many other gardens, I have several times remarked, says the author, and particularly during the month of August last, that when a pear was accidentally sustained by the trellis and wall, or was placed in the fork of two branches, it was generally larger, than those on the same tree, which were freely suspended from the branches. I presumed that this difference was thus occasioned; that when the fruit attained a certain size, its weight contracted the tubes and vessels of the peduncle destined to conduct the sap of the tree, and prevented it from obtaining a size equal to such as were supported and consequently more favourably situated, for receiving the nourishing juices. I was, therefore, desirous of ascertaining how far this hypothesis would be confirmed by experiments, upon different kinds of pears; M. Dalbert, an intelligent and zealous gardener, aided me in making them, in the department of fruit trees, in the Royal Garden. We first selected a young tree bearing a pear called the *Duchesse D'Angouleme*, figured in the *Flora et la Pomone Française* (Pl. LVI.) A pear, situated near the middle of the tree, was, on the 15th of September, nine inches and four lines in circumference, it was left suspended from the branch. Another pear situated lower, was at the same time eight inches and ten lines in circumference. We placed under the latter a little shelf fixed upon a stake driven into the ground, in such a manner that the pear was supported by it. The 30th of September following, the two pears were gathered; the first, which remained suspended, had increased but two lines, and the second which was supported by the shelf, was nine inches and seven lines in circumference: it had gained nine lines, which is considerable, for so large a pear, and in fifteen days.

It may be objected, that the position of the pears upon the upper or lower branches, contributed to increase the size of one more than the other.

We selected two pears, called Beurre D'Aremberg, growing on the same branch and emanating from the same fruit spur. On the 15th of September, one of them was eight inches and four lines in circumference, which was left suspended; the other was eight inches and was supported by a shelf. The 7th of

October following, both pears were gathered; the first had increased but two lines; the second was eight inches and eight lines in circumference, having been enlarged eight lines. It will be seen that the largest of the two pears was left suspended and the smallest was supported. An experiment, the reverse of this was made.

Upon a Chaptal pear tree, figured in the Flora et la Pomone Française (Pl. XCIII.) two were selected, which emanated from the same fruit spur: instead of placing the shelf under the smallest it was put under the largest, which, on the 15th of September, was three lines greater in circumference, than the other. On the 15th of October, these two pears were gathered; the largest was then nine lines larger than the other, that is, it had increased six lines more.

From these experiments, it is believed, if they were repeated the following year, and commenced in July or August, a more marked difference and more satisfactory results would be produced; and my theory could be applied to other kinds of fruits, such as Quinces, Apples, Oranges, &c.

Art. VI.—*Trimming Roots of Fruit Trees.*

[FROM THE AMERICAN FARMER.]

"George Town, (D. C.) 3d month, 1831.

Namesake:—The great benefit of thy extensive Journal is, to communicate results; and the more extensive its circulation, of course the more beneficial its effects will be: and especially, *if every man will do his duty;* (as it has been said John Bull, *or some of his subjects*, had required of his men.) Then each agriculturist may be put in possession of the best mode hitherto reduced to practice, in most, or all the various branches of pursuit in husbandry, and at the small expense of the American Farmer. And again, each one may examine for himself, and see, whether the crops which he cultivates, are the best which can be adapted to his soil and condition.

But to the subject: trim before you plant. On the 6th day of 4th mo. 1830, a near neighbour and myself, had each a nice young apricot tree sent us: he took choice; they were then in bloom; we each planted our trees in puddle—that is, we took rich earth, about such as would be considered a good garden soil, *and made it so limber with water that it would just run*, and when we set out the trees in the holes prepared for them, poured the puddle on the roots until they were covered, then filled the holes

up nearly even full, with the earth that had been taken out; the trees were planted about nine inches deep. The only difference in our mode of planting was this: he planted his just as it came to hand; I trimmed off all that portion of the end of each root, that appeared to have become dry by exposure to the atmosphere; (the trees were about one inch diameter, brought from the same nursery, and carried about three miles;) now see the result. My tree did not appear to have suffered the very least by the removal. My neighbour's tree was sick, and seemed as though it would die until late in the season, then it revived and became green, and looked healthy.

I considered this a very plain case: and thought it one that might be useful to some of the readers of the American Farmer—*it may be to all.* Every one will see, that the ends of the roots, no matter how small, are in fact the mouths that take in the nourishment of the tree; and, that if these, by exposure to the atmosphere, become dry, they of course lose their tone, they cannot operate, consequently the tree must suffer for the want of food—and the only remedy is, that the tree must throw out new roots, which, according to the course of nature, will each have its mouth, and thus the tree is enabled again to gather food. But if the roots are all trimmed off to the fresh wood, then each one will perform its proper function, and the tree sustain very little or no injury by a removal—and it may be at almost any season of the year. Very respectfully thine,

GIDEON DAVIS.

ART. VII.—*Fruit Trees.*

[FROM THE AMERICAN FARMER.]

Columbia, (S. C.) March 16, 1831.

MR. SMITH:

Dear Sir,—Any thing that may have a tendency to the improvement of our fruit trees, their health and permanency, cannot be devoid of interest any where; but it must be so particularly in a country like this that is comparatively new. Mere speculations, even, are not to be despised when they are grounded on apparently sound or plausible reasoning. I make, therefore, no apology for offering you for publication a few crude observations on the probable advantages of renewing our fruit trees by means of seeds, and I wish particularly to apply them to the grape vine.

I am not prepared to go the whole length in the theory, if not originated, at least powerfully supported by T. A. Knight, Esq. the justly celebrated president of the Horticultural Society of England, that trees propagated by grafts, layers and cuttings, fully partake of the natural length of life of the parent stock, and finally decay as the parent does, without deriving all the advantages that are expected from the renewed life produced by the above named means. Without opposing opinions emanating from so high a source, or giving them my full and entire assent, I may, perhaps, without undue presumption, still doubt a little as to their fullest extent. We must, however, admit that the means which nature uses commonly for the propagation of the numberless genera and species of plants, by seeds, must be the best, and that any other mode, however successful it may be, must fall somewhat short of the perfection of the most natural one. It is not amiss to notice here, however, that what we consider perfection in fruit for the use of man, is sometimes very different from that perfection which nature always aims at, viz. the production of perfect seeds. The effect of long and careful cultivation has in many cases been that of suppressing the seeds in fruits as we find in several kinds of potatoes, both the "Convovulus Batata" and the "Solanum tuberosum," as also of several grapes, as the "Seedless Corinth," the "Sultana" and others; by which, though they are rendered more desirable for the table, and are therefore looked upon as perfected by culture, they are in truth, according to nature's views, degenerated. It may also be owing to this long state of cultivation in many of the European and other foreign grape vines, that their wood is pithy and weak, forming at best only low and weakly vines when compared with our stronger and more vigorously growing natives. The usual effect of long culture is certainly to diminish not only the size, but also the number of seeds in the berries of the grapes, by which they are truly rendered more pleasant for the table, although impaired for their natural uses. Some of them have probably been propagated by means of cuttings and layers more than one or even two thousand years, and it is not surprising, if Mr, Knight's theory be true, that they have lost much of that vigour which is so remarkable in that family of plants in their native state. Whether this theory is correct in its fullest extent or not, it will not probably be disputed that there must be considerable advantages of renewing our valuable fruit trees, and principally the vines, by raising them from seed. It will be objected that fruit raised from seed, is seldom equal to that from which the seed was obtained. Although this is undoubtedly true, it must be admitted as equally so, that all the fine varieties are chiefly due to this mode of producing new varieties, which are, moreover, probably perfected by culture. That the

raising of fruit trees and vines by means of seeds, requires time, expense, attention, and perseverance, I cannot deny; but is there any thing of value in this world that can be obtained without them? Among the vines raised from seed, a considerable portion of them are male plants which produce no fruit; these, however, need not be lost; for they may be used (as also the fruit bearing ones that are worthless as to the quality of the fruit) for stocks for grafting the desirable ones upon.

I regret exceedingly that the difficulties attending the sending objects of this kind from this place, are so great as to be discouraging; else I should have thought in time of sending you a quantity of grape seed for distribution, which I have saved from my last crop. I should do it even now, late as it is, were it not that the conveyance by the stage is totally unsafe and very expensive withal. *Should it be desirable*, however, I intend saving a quantity next summer, and forwarding them to you for the purpose of distribution.

If you think, sir, these desultory observations worthy of a place in the "American Farmer," I beg you will have them inserted, which may perchance be productive of some good, which is the only object, dear sir, of your obedient servant,

N. Herbemont.

Art. VIII—*Summer Fallows.*

[from the genesee farmer.]

To summer fallow sward land is a common practice in this section of country, but we are convinced from our own observation, that this is not the most economical method. After the crop of wheat, the stubble ground is often planted with corn; now this is getting the cart before the horse. Let your sward land be ploughed late in the fall, or early in the spring, and made ready for corn. If the corn is well tended, the grass will all be killed, and the decomposing vegetable matter will furnish its greatest supply of food to the roots, at the time the ears are filling out; and as a general rule, we get the finest yield of corn from turf ground, although we do not get as large a growth of stalks. This is as it should be, to get the most corn with the least expense of soil. The contrary is the case, when we plant stubble land—we get larger stalks, but less corn, as the greatest quantity of vegetable nutrition, from the decaying turf, is furnished the roots in the fore part of summer, and there seems a lack of it at the time the ears are filling out. It will be found by observation, that corn raised on sward land, where it is well tended, is always more full at the points of the ears, than that raised upon stubble land. Again, when sward land is summer

fallowed, unless the season is very favourable, the roots of grass are not entirely killed, and it will be found upon examination, that most of the sods which lie upon the surface in the spring after the wheat is sowed, have roots and runners of grass leading out from them in every direction, claiming the right of primogeniture over the wheat, and depriving it of a share of vegetable nutrition; and it will be found by actual calculation, in many instances, that these sods and roots extend over one quarter of the surface; and it is from this circumstance, that many pieces of stubble land produce so much pasturage after the wheat is taken off, where they have not been seeded with grass or clover; which sometimes renders the hoeing of the succeeding corn crop more difficult than when it succeeds the sward. When corn is made the first crop, the land is in a state of fallowing all summer; that is, the hoeing in the fore part of the season, and the shading from the corn, in the latter part, is as effectual in subduing the roots of the grass, as summer fallowing would have been, continued for the same length of time. By making wheat the second crop, and summer fallowing the stalk ground, the subduing process is continued twice as long as it would have been in case you had made wheat the first. The breaking up of your stalk ground, does not require as much strength of team, (and teamwork at this faint season of the year is important) neither do the after ploughings, as when the crops are reversed. Your grounds become completely subdued, the grass roots all dead, and such seeds as were in the ground have had an opportunity to vegetate and are destroyed, and the whole surface prepared to give nutrition to the wheat alone. It often happens that mowing lands are of prime importance, and that a rotation of crops are resorted to as renovators for such lands, and it is desirable to return them to grass as soon as possible after the surface is made fine and smooth. This can be done by stocking with the wheat; but if wheat was the first, then corn, it would require a third crop before it could be returned to grass. Now if the farmers will give this a fair trial, they will find that the saving of labour will be about one quarter, and the increase in the two crops will be in an inverse ratio, or an average gain of twenty-five per cent, over the method commonly practiced for the two crops.

Art. IX.—*On Ploughing.*

[from the American Farmer.]

"North-Carolina, March 25, 1831.

Mr. Smith: I propose to offer a paper or two on this first and most important operation of Agriculture; and if my opinions and

my manner of communicating them are tolerated, I may extend my remarks to some other particulars of this first and best of arts.

Before I speak of ploughing, it is necessary to premise that all planted crops should be in drills and not in hills, and all sown crops in beds, for reasons that will appear obvious in my manner of ploughing, and by some observations on planting that may perhaps follow. The fact is all that is now necessary to be understood.

Of ploughs I will say but little. It is indispensable that they should be good, run deep, and be of a form to turn a furrow with the least possible resistance. The avoirdupois weight of a plough is a matter of little consequence, except that a heavy plough runs more steadily; for the difference of ten or fifteen pounds would not be perceptible to a team capable of carrying a thousand; but the deviation of an inch in the form of a mouldboard will affect the draught more than fifty or a hundred pounds.

Teams must be strong. The superficial scratching of a bad plough, and a weak team, can promise nothing favourable to the farmer. Room is not afforded for the crop roots to penetrate, nor is the earth loosened to suffer the moisture to rise, nor for the rains which will fall to penetrate: either rain or drought in the smallest excess ruins the crop: it can only be worked in seasons exactly favourable, and the scratching farmer's cares and anxieties are only relieved by his land soon washing away. As that goes down the rivers, he goes over the mountains. Wherein consists the patriotism of a bad farmer? This sort of itinerant needs a new appellation.

Farmers often object that they cannot plough deep, as from the fewness of their horses they cannot afford to double their teams, that is put two horses to a plough. I know from experience, that eight horses if doubled when breaking up, will tend as much land, and make a better crop than ten working singly. This apparent paradox, if not now obvious, will be solved in some future number if I find expedient to write it.

Land should never be flushed up or cross-ploughed *for any preparation.* It should be bedded for corn, wheat, and every other crop, and the water furrow of one crop should be the ridge of the next.

In reversing the beds begin in the water furrow. The deepest ploughing is thereby made deeper. The sides of the old beds are sliced off and thrown together to form new ones: with every repetition you can plough deeper and deeper, and soon arrive at a depth quite incredible to the skimmers.

Cross-ploughing is very deceptious. Superficially observed, work seems to have been done, but in fact the ridges are merely scraped off to fill furrows. Deep ploughing is out of the question. Jethro Tull, in his book, (as I may quote perhaps hereafter,) condemns cross-ploughing for some particular reasons that will deserve consideration.

De Rustica.

PART III.

MISCELLANEOUS INTELLIGENCE.

New Silk Reeling and Twisting Machine.—We have much pleasure in announcing, that Mr. Hack, the ingenious machinist of the Savage Factory (near Baltimore,) has invented a machine for *reeling and twisting silk* at the same time. It was exhibited at the Farmer office, on Friday last, and the editor tried it himself, by winding off some cocoons, which it performed to great perfection—winding off the silk, twisting it, and winding it upon bobbins, at the same time; making the thread of raw silk as round, even and smooth, as the most perfectly drawn wire. We also made some sewing silk of some flos, far superior for evenness and twist, to any we have seen. The machine is intended to perform every operation necessary in preparing the silk from the cocoon to the loom, except extracting the gum. After the first operation of drawing the fibre from the cocoons, the bobbins are placed upon the spindles, and as many original threads as may be wanted to form one of the required size, are combined, and passed through the machine, when the thread is doubled and twisted, and finished for whatever purpose it may be wanted. The degree of twist can be varied as may be necessary, so that the most partially twisted flos, or the most perfect warp, filling or sewing silk, may be made with equal facility. Indeed, with the aid of this machine, we see no reason why our farmers' wives and daughters may not dress themselves in domestic silk, with as little labour and expense, as are required now, in the production of their most common cotton homespun. The management of the machine is easily learned; as may be supposed from the fact, that the editor made several kinds of silk, of a superior quality, with it, at the first trial; and that it did not require five minutes to acquire a knowledge of its management. Little girls can work it perfectly, and we should suppose one girl could draw from the cocoons, and finish perfectly, at least a quarter of a pound of silk a day, with the assistance of a small boy to turn the cranck for her. We cannot pretend to describe the machine. It is about two feet wide, two and a half high, and probably three feet long. It winds off and twists eight threads at a time; but they can be extended to any required number, so that ten, twenty, fifty or a hundred women may be employed at the same machine; but, any considerable enlargement of the machine, would require horse, water or steam power to work it—probably a man might turn it for the employment of ten women, but for no more.

The machine has been taken to Washington for exhibition to the members of Congress, and probably to secure letters patent, but will be deposited in the Farmer office for public inspection, in a few days, when we shall be happy to shew it to those interested. Although Mr. Hack intends to patent his valuable invention, it is merely for the purpose of securing the manufacture of the machines—it will add nothing to the cost of them to the public. The cost of a complete machine will not exceed sixty dollars, and the editor is authorised to receive orders for them at that price. The work-

manship is really beautiful, and of the highest finish—as creditable to Mr. Hack's skill as a workman, as the invention is to his genius.

Mr. Hack had never seen a cocoon, when a gentleman called on him to make something with which he could reel silk. He requested the gentleman to bring him some cocoons, and said he would try to make something to suit him. The cocoons were brought, and he produced the above mentioned machine. This furnishes another evidence of the capability of American genius to supply every thing that American necessity or luxury may require. It is probable that this machine will supersede every other in use in silk manufacture—it certainly, we think, will render still more inexpedient the expenditure of forty thousand dollars by government for teaching a few young men to reel, and the importation of machinery for twisting silk.—*American Farmer.*

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New Food for Cattle.—Mount Prospect, (N. C.) March 15, 1831:—Mr. Smith: I have made a new discovery in fattening cattle, (however it may not be new to others, yet it is so to me,) I made a small experiment about twelve months ago, which encouraged me to try it more fully the past winter, and find it to exceed my expectations. The food is turnips and cotton seed boiled together, with a little salt in it—it is preferable to any food I ever made use of in fattening cattle, or for milch cows. I make use of about equal quantities of each. Turnips alone, or cotton seed alone, is very good to keep cattle alive through the winter; but when combined as above stated, it excels any thing I ever tried for cattle. If you think the information worth publishing, perhaps it may benefit some of your southern subscribers. Yours, very respectfully, Exum Lewis.

P. S.—The turnips ought to be washed clean.—*American Farmer.*

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Seed Corn.—I have been in the habit a number of years, (says a writer in an Eastern paper) of selecting the *best ear of two that grows on a stalk of corn*, and have found it annually to improve to a very considerable increase. After pursuing the experiment for three years, and establishing the fact in my own mind, that by this method there was a constant and accumulative increase and improvement, I communicated the circumstance to my neighbour—he was quite incredulous, and I invited him to a thorough experiment. We took each our field of equal quality of soil, and richness, lying side by side—planted them on the same day, and tilled them alike as we could; the result was, that his, from ordinary seed, produced nearly forty bushels; while mine, from the selected and improved seed, gave me about sixty bushels per acre.—*Genesee Farmer.*

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Preserving Grain.—A discovery of considerable importance has been announced, with regard to preserving grain. To preserve rye, and secure it from insects and rats, nothing more is necessary than not to fan it after it is threshed, and to stow it in the granaries mixed with the chaff. In this state it has been kept more than three years, without experiencing the smallest alteration, and even without the necessity of being turned to preserve it from humidity and fermentation. The experiment has not yet been made with wheat and other kinds of grain, and they may probably be preserved in chaff with equal advantage.—*United States' Agriculturist.*

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Lime necessary for raising Peas.—It is observed that the common pea, whether white or grey, cannot be reared to perfection in any field which has not been, either naturally or artificially impregnated with some *calcareous* matter. And hence it is supposed to happen that peas are only cultivated universally as a field crop, unless in those parts of the country where either lime, marl or chalk abounds, or upon strong clays; except indeed on the sea coast, where shell fish are often caught in abundance, and where the fields are manured with their shells in a state of mixture with dung. But

it is remarkable, that a soil that could scarcely have brought one pea to perfection, although richly manured with dung, from their running too much to haulm, and after blossoming, dying away without becoming ripe, if it has once had lime applied upon it, is capable, when properly prepared in other respects, of producing plentiful crops of peas ever afterwards.

[*Farmer's Companion.*

On Preserving Hams.—Mount Columbo, Dallas Co. Ala. Jan. 23, 1831.

Mr. Smith: * * * I have taken the American Farmer from its first publication, and have tried every way which has been recommended by its correspondents, to preserve hams, &c. free from bugs, worms, and rancidity. With me, not one of them succeeded well. The greatest difficulty in a warm climate, is to preserve them free from rancidity. After being so unsuccessful in experiments, which might, perhaps, succeed well in colder climates, I resolved to pack my hams in charcoal, knowing its antiseptick qualities. This has succeeded to my perfect satisfaction, and I will not hereafter try any further experiments in this matter.

It is of great importance, to have the hams, &c. dried as early as possible, that they may be packed away before the season arrives for the bug or fly to attack them. If this is effected in due time, and they are well packed in dry charcoal, made moderately fine, I feel well assured that the lover of good hams, will have no reason to regret having made the experiment. The difficulty of getting the charcoal off, may be made an objection by the neat house-wife, but this is not much greater than to get ashes off when bacon is packed in ashes, as is the practice with many. As the season will soon arrive, when every prudent house-keeper may wish to save his bacon, I have thought proper to state my experience upon the subject, wishing it to pass for no more than its real value. Your obedient servant,

Andrew Pickens.

[*American Farmer.*

Chinese Corn.—A new species of corn from China has been introduced into Ireland, a sort of skinless oats, the most valuable produced in any country. It has many advantages over other grain, when thrashed from the sheaf, it is exactly like oatmeal, fit for immediate use, and free from any particle of rind or husk.

The flavour is delicious, and it contains much farinaceous matter. There accrues, of course, a great saving of the oats and expense of kiln drying, grinding, and sifting, is avoided. The average produce is twenty-six barrels of 14 stone, to the Irish acre. It is remarkably hardy, and well adapted for this climate.—*Limerick Chronicle.*

Invention for Republics.—A new kind of bee hive has lately been invented, which promises to be of great utility to those engaged in raising bees. It consists of a number of cells, about the size of small bee hives, or about from twelve to fifteen inches square, and from fifteen to eighteen inches deep, arranged like the pigeon holes in a writing desk, or a number of bee-hives piled upon their sides. The number of these cells may be according to the taste of the builder: say four rows up and down, and ten long, making forty cells. These should be enclosed in a tight house, of sufficient dimensions to allow a person room to pass freely before and behind them, and they should be supported at such a distance from the floor as to be convenient for examination. In front of these there should be a number of small holes made through the side of the building, sufficient for the bees to pass in and out. In the back end of each cell there may be a slide, or door, for the purpose of taking out the honey. The building, if made of wood, should be carefully made, not allowing cracks or joints, through which mice could enter, and a door in the rear for the keeper to go in and out at. Into these cells a number of swarms of bees are introduced, and it is said that they work as well as in hives of common construction—that they never

leave the house by swarms, as long as there is an empty cell for the young colony to emigrate to. There is no necessity for destroying the bees to get the honey They are not troubled with the moth, where the house is tightly made, and where the door is well secured, they are not so liable to be robbed by—man.—*Genesee Farmer.*

French preparation of Coffee.—Mr. SMITH: In all that concerns the table, the French far excel all other nations. Their dishes are savory, palatable, soluble, and wholesome. Your receipt for making coffee according to the French mode, in the last or 12th volume of the Farmer, is good, if it provides, (which I do not recollect, and my volume is at the binders,) that the ground coffee be wet into a paste, and kept in a glazed vessel over night, before used in the morning; but you have omitted two important particulars which I will supply—one I derived from the published letters of Mr. Carter, of New-York, who lately travelled in France, and the other from a gentleman who had resided in a French family which came to this country from St. Domingo. Mr. Carter says, the French add boiled milk to their coffee, which gives it a mellowness not to be imparted by cold milk or cream; and my other information is, that the French sweeten their coffee with sugar candy, or sometimes with what is about the same thing, with clarified syrup, not yet reduced to a state of crystalization. The process for making either of these is sufficiently simple, but as the last has abridged labour, and many conveniences to recommend it, I will speak only of that. An egg with its shell is beat up to a froth and added to two or three quarts of water in a bell metal kettle—from eight to twelve pounds of sugar, (either brown or white) is added to this, (I am told a few glasses of lime water is a useful addition, but I have not tried it,) and it is simmered and scummed over a bark or coal fire, until clarified and reduced to a syrup of the proper consistency, when it is put up for use. Besides for coffee, this syrup is also excellent for fritters, puddings, &c. if a little Cogniac is added to it. I have tried all—the strained coffee, the boiled milk, and the clarified sugar, and commend the whole. COUSIN TABITHA.

[*American Farmer.*

Important Invention for Manufacturers.—Substitute for Indigo as a dye.—Napoleon offered a premium of three millions of francs to the person who should discover some material the production of France, that should in all respects answer as a substitute for indigo. In consequence of this stimulus, M. Souchon, a practical chemist and dyer, expended a fortune in experiments, which finally resulted in the discovery of a method for fixing the colour of prussiate of iron, even more permanently than indigo blue. With this preparation he has succeeded in dyeing green, blue blacks, and black, at an expense of little more than one-third of that of indigo colours, and said to be in every respect equally fine and permanent.

We learn that Mr. Arnold Buffum, of this State, during his residence at Paris, effected a contract with M. Souchon, for the communication of the process to him, to be introduced into the United States; and that he has recently received a full explanation of the method by which this important desideratum is effected.

The colors are said to resist the action of both acids and alkalies, and when worn for years, (as we have seen stated by a mercantile house of high standing in Paris,) will present no whitened appearance on the seams, or at the pocket and button holes of garments; the colours there remaining unchanged—*Providence (R. I.) American.*

Profitable Management.—A general rule among farmers should be, to keep the best and sell the poorest living productions of a farm. The most indifferent fowls, pigs, lambs, and calves, should be selected and sold. The best kind of seeds and grain designed for sowing, should be preserved. The choice butter and cheese, the best of the hams and salted meat, and the finest domestic cloth should be sent to market.—*American Farmer.*